

INTERNATIONAL CRITICAL TABLES
OF
NUMERICAL DATA
PHYSICS, CHEMISTRY AND TECHNOLOGY
—
VOLUME III

INTERNATIONAL CRITICAL TABLES OF NUMERICAL DATA, PHYSICS, CHEMISTRY AND TECHNOLOGY

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OF THE
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ARRANGEMENT OF CHEMICAL SUBSTANCES

Throughout *I. C. T.*, except when otherwise indicated, the tabular arrangement of all chemical substances and of all systems capable of representation by formula is in accordance with a system called the "Standard Arrangement," which will now be explained and which should be learned by every user of *I. C. T.*

Elementary Substances

All tables containing *only* elementary substances (A-Tables) are arranged in alphabetical order of the symbols of the elements. In tables containing both elements and compounds (A-B-Tables) the elements follow the "standard arrangement," *v. infra*.

Chemical Compounds and Other Systems Represented by Formula

The arrangement is based upon the following table of "Key-numbers" of the elements:

KEY-NUMBERS OF THE ELEMENTS

-6	-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10
(He)	(Ne)	(A)	(Kr)	(Xe)	(Rn)	O	H	F	Cl	Br	I	(85)	S	Se	Te
						46	47	48	49	50	51	52	53	54	55
						Cr	Mo	W	U	V	Cb(Nb)	Ta	Pa	B	Al
Ac	Ag	Al	As	Au		B	Ba	Be	Bi	Br	C	Ca	Cb	Cd	Ce
74	32	55	13	33		54	79	75	15	5	16	77	51	29	59
						Os	P	Pa	Pb	Pd	Po	Pr	Pt	Ra	Rb
						35	12	53	23	41	17	60	37	80	84

To locate a given compound, first write its "key-formula," neglecting water of crystallization, thus:

ARRANGEMENT DES SUBSTANCES CHIMIQUES

L'arrangement tabulaire de toutes les substances chimiques et de tous les systèmes susceptibles d'une représentation par formule est, dans les *T. C. I.*, excepté lorsqu'il y a une autre indication, en accord avec un système appelé "arrangement type," (standard arrangement) expliqué ci-dessous, qui devra être appris par chaque personne qui veut utiliser les *T. C. I.*

Substances Élémentaires

Toutes les tables ne contenant que les substances élémentaires (Tables A) sont arrangées dans l'ordre alphabétique des symboles des éléments. Dans les tables contenant les éléments et les corps composés (Tables A-B) les éléments se trouvent suivant "l'arrangement type," *voir infra*.

Composés Chimiques et Autres Systèmes Représentés par Formule

L'arrangement est basé sur la table suivante des "nombres-clés" des éléments:

NOMBRES-CLÉS DES ÉLÉMENTS

11	12	13	14	15	16	17	18	19	20
N	P	As	Sb	Bi	C	Po	Si	Ti	Ge
56	57	58	59	60	61	62	63	64	65
Sc	Y	La	Ce	Pr	Nd	(61)	Sa	Eu	Gd
Cl	Co	Cr	Cs	Cu	Dy	Er	Eu	F	Fe
4	44	46	85	31	67	69	64	3	43
Re	Rh	Ru	S	Sa	Sb	Sc	Se	Si	Sn
34	40	39	8	63	14	56	9	18	22

Afin de situer un composé donné, il faut d'abord écrire sa "formule-clé," en négligeant l'eau de cristallisation ainsi:

Compound	Composé	Na_2SO_4	$\text{HClO}_4 \cdot 3\text{H}_2\text{O}$	$\text{Hg}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2$	$2\text{Fe}_2\text{O}_3 \cdot \text{P}_2\text{O}_5 \cdot 12\text{H}_2\text{O}$	$\text{Ni}_3\text{Pr}_2(\text{NO}_3)_{12} \cdot 24\text{H}_2\text{O}$	$\text{I}_2\text{C}_6\text{H}_3\text{SO}_3\text{H}$	$(\text{NH}_4)_2\text{CO}_3$
Key formula	Formule-clé	82-8-1	4-2-1	30-16-2-1	43-12-1	60-45-11-1	16-8-6-2-1	16-11-2-1

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DIE ANORDNUNG DER CHEMISCHEN VERBINDUNGEN

Durch die ganzen I. C. T., ausgenommen es ist etwas anderes angegeben, ist die tabellarische Anordnung aller chemischen Verbindungen und aller durch chemische Zeichen oder Formeln darstellbarer Systeme, nach der "Normal-Anordnung" (standard arrangement), durchgeführt. Sie ist im folgenden dargelegt und soll von jedem Leser der I. C. T. erlernt werden.

Elementare Stoffe

Alle Tafeln, welche *nur* elementare Stoffe (A-Tabellen) enthalten, sind in alphabetischer Reihenfolge nach den Symbolen der Elemente angeordnet. In den Tafeln, welche beides, Elemente und Verbindungen (A-B-Tabellen), enthalten, folgen die Elemente der "Normal-Anordnung." Siehe weiter unten.

Die chemischen Verbindungen und andere durch Formeln darstellbare Systeme

Die Anordnung ist auf der folgenden Tafel begründet, welche die "Schlüsselnummern" der Elemente enthält:

SCHLÜSSELNUMMERN DER ELEMENTE

21	22	23	24	25	26	27	28	29	30
Zr	Sn	Pb	Th	Ga	In	Tl	Zn	Cd	Hg
66	67	68	69	70	71	72	73	74	75
Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ac	Be(Gl)
Ga	Gd	Ge	Gl	H	Hf	Hg	Ho	I	In
25	65	20	75	2	73	30	68	6	26
Sr	Ta	Tb	Te	Th	Ti	Tl	Tm	U	V
78	52	66	10	24	19	27	70	49	50

Um eine gegebene Verbindung aufzufinden, hat man zuerst seine Schlüsselformel aufzuschreiben, wobei man das Kristallwasser auslässt. z.B.:

Verbindungen	Composto	Na_2SO_4	$\text{HClO}_4 \cdot 3\text{H}_2\text{O}$	$\text{Hg}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2$	$2\text{Fe}_2\text{O}_3 \cdot \text{P}_2\text{O}_5 \cdot 12\text{H}_2\text{O}$	$\text{Ni}_3\text{Pr}_2(\text{NO}_3)_{12} \cdot 24\text{H}_2\text{O}$	$\text{I}_2\text{C}_6\text{H}_3\text{SO}_3\text{H}$	$(\text{NH}_4)_2\text{CO}_3$
Schlüsselformel	Formula chiave	82-8-1	4-2-1	30-16-2-1	43-12-1	60-45-11-1	16-8-6-2-1	16-11-2-1

ORDINE DI ELENCAZIONE DELLE SOSTANZE

In tutti i volumi delle T. C. I. l'ordine in cui le sostanze ed i sistemi rappresentabili con formule sono disposti nelle tabelle è (tranne che non sia diversamente indicato) quello "standard" illustrato più avanti. Chiunque voglia servirsi delle T. C. I. deve anzitutto apprendere in che consiste questo sistema "standard."

Sostanze Elementari

Tutte le tabelle contenenti soltanto sostanze elementari (Tabelle A) sono disposte secondo l'ordine alfabetico dei simboli degli elementi. Nelle tabelle che comprendono elementi e composti (Tabelle A-B) gli elementi sono ordinati secondo la disposizione "Standard," v. *infra*.

Composti Chimici ed Altri Sistemi Rappresentati da Formule

La disposizione è basata sul quadro seguente di "numeri chiave" degli elementi:

NUMERI CHIAVE DEGLI ELEMENTI

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Cu	Ag	Au	Re	Os	Ir	Pt	Ma	Ru	Rh	Pd	Mn	Fe	Co	Ni
76	77	78	79	80	81	82	83	84	85	86				
Mg	Ca	Sr	Ba	Ra	Li	Na	K	Rb	Cs	(87)				
Ir	K	La	Li	Lu	Ma	Mg	Mn	Mo	N	Na	Nb	Nd	Ni	O
36	83	58	81	72	38	76	42	47	11	82	51	61	45	1
W	Y	Yb	Zn	Zr	(61)	(75)	(85)	(87)						
48	57	71	28	21	62	34	7	86						

Per trovare il posto di un dato composto bisogna prima scrivere la formula chiave trascurando l'acqua di cristallizzazione, p. es.:

In writing a key-formula the key-numbers must be written in descending order.

All chemical compounds (**B**-Tables) are arranged in the inverse numerical order of their key-formulae. *Example:* to find the compound $\text{Hg}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2 = 30 - 16 - 2 - 1$: First, turn to section 30 of the table. Then follow down the column of chemical formulae until element 16 (C) is first encountered. From this point continue until element 2 (H) is found, and then on until element 1 (O) is reached. At this point will be found all the compounds composed of the four elements Hg, C, H, and O and these compounds are arranged in an obvious manner according to the subscripts in the chemical formula. To facilitate the use of the tables, key-numbers are inserted at frequent intervals either along the top of the page or down the left-hand column or both.

In looking for a chemical compound *always consult the B-Table*, the scope of which provides for *all* chemical compounds except those of the radioactive elements, of which only compounds of U, Th and Ra are given in the **B**-Table. For the others, see Vol. I, p. 364. In certain of the **B**-Tables, at the point where key-formulae beginning with 16 occur, there will be found frequently only a few of the simpler compounds, and the reader will be referred to a **C**-Table where the remainder of such compounds will be found listed under a different arrangement known as

The C-Arrangement

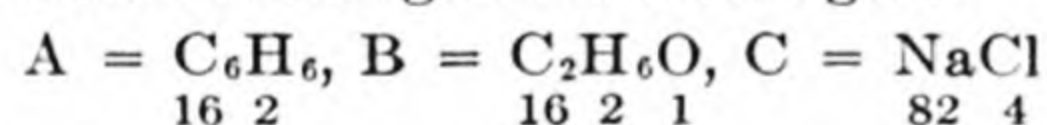
In this arrangement the compounds are arranged according to their empirical formulae (including water of crystallization), in the order C, H, with the remaining symbols alphabetical, *e.g.*, $\text{C}_6\text{H}_4\text{I}_2\text{O}_3\text{S}$. The **C**-Tables, however, will not contain any carbon compound whose key-formula contains a number greater than 16.

SYSTEMS OF MORE THAN ONE COMPONENT

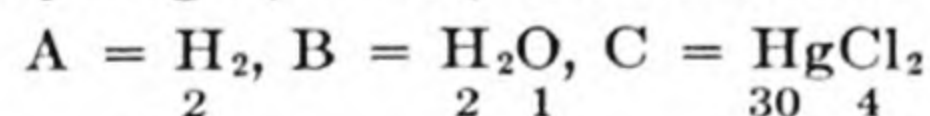
Case I.—The Nature of the A-Component Is Not Specifically Designated

To find a given system: First arrange the components of the system in order according to the arrangement stated for the table (*i.e.*, according to the standard arrangement or the **C**-arrangement as the case may be).

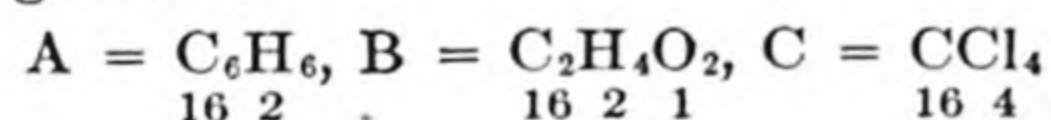
Example: For the system, sodium chloride, ethyl alcohol, benzene, the standard arrangement would give:



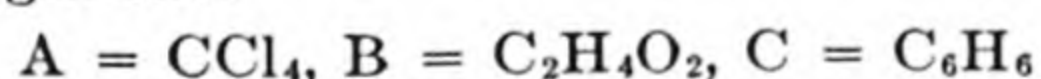
For the system, hydrogen, water, mercuric chloride:



For the system acetic acid, benzene, carbon tetrachloride in the standard arrangement:



In the **C**-arrangement:



The systems in the table are arranged in order of their A-components in the arrangement stated. All systems having the same A-component will be found under that component arranged in order of their B-components, etc., for the other components. To facilitate the use of the tables the initial key numbers (for standard arrangement) or the number of carbon atoms (for the **C**-arrangement) of the A-components are inserted at frequent intervals along the top of the page. By use of these numbers the reader will be able to turn quickly to the page upon which a given system should be found.

Case II.—The A-Component Is Specifically Designated

In Case I it is necessary to make use of the stated arrangement in order to determine the A-component of the system. In many

Lorsqu'on écrit une formule-clé, les nombres-clés doivent être écrits dans l'ordre des valeurs décroissantes.

Tous les composés chimiques dans toutes les tables (Tables **B**) sont arrangés d'après l'ordre numérique inverse de leurs formules-clés. *Exemple:* Pour trouver le composé $\text{Hg}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2 = 30 - 16 - 2 - 1$: Il s'agit premièrement de chercher la section 30 de la table; ensuite de suivre en descendant la colonne des formules chimiques jusqu'à ce qu'on trouve l'élément 16 (C). De ce point, on continue jusqu'à ce qu'on rencontre l'élément 2 (H), et ensuite jusqu'à ce que l'élément 1 (O) soit atteint. On trouvera alors à ce point tous les composés renfermant les quatre éléments Hg, C, H et O et ces composés sont arrangés d'une manière apparente en relation avec les indices de leurs formules chimiques. Afin de faciliter l'usage des tables, les nombres-clés sont inscrits, à de fréquents intervalles, ou au haut de la page ou le long de la colonne gauche, ou aux deux places.

Pour la recherche d'un composé chimique, il s'agit de *consulter toujours la Table B* dont le but est de renseigner sur tous les composés chimiques, à l'exception des éléments radio-actifs, dont seuls ceux de U, Th et Ra sont donnés dans la Table **B**. Pour les autres, voir Vol. I, p. 364. Dans certaines des Tables **B**, au point où les formules-clés commençant par 16 se présentent, on ne trouvera fréquemment qu'un petit nombre de composés plus simples, et le lecteur sera alors renvoyé à une Table **C**, où le reste de ces composés se trouvera disposé d'une façon différente nommé

L'Arrangement C

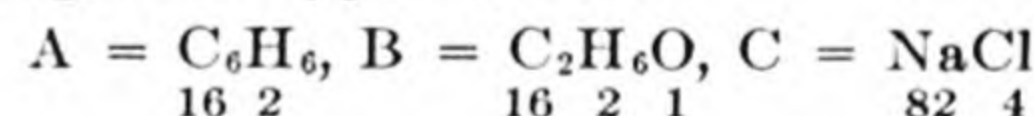
Dans cet arrangement, les composés sont disposés en relation avec leurs formules empiriques (l'eau de cristallisation inclusive-ment) dans l'ordre C, H, les symboles restants venant ensuite dans l'ordre alphabétique; par ex: $\text{C}_6\text{H}_4\text{I}_2\text{O}_3\text{S}$. Cependant les Tables **C** ne contiendront aucun composé dont la formule-clé renferme un nombre supérieur à 16.

SYSTÈMES À PLUS D'UN CONSTITUANT

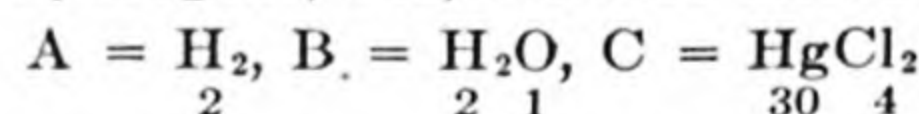
Cas I.—La nature du constituant A n'est pas spécifiquement désignée

Pour trouver un système donné il faut: Premièrement arranger les constituants du système dans l'ordre en accord avec l'arrangement fixé pour la table (*i.e.*, en accord avec l'arrangement type, ou l'arrangement **C** suivant les cas).

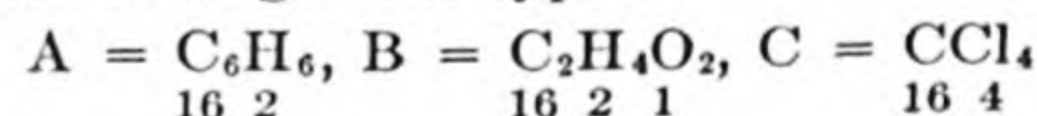
Exemple: Pour le système, chlorure de sodium, alcool éthylique, benzène, l'arrangement type donnera:



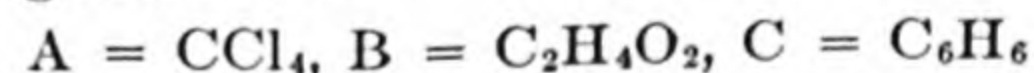
Pour le système hydrogène, eau, chlorure mercurique:



Pour le système, acide acétique, benzène, tétrachlorure de carbone on aura suivant l'arrangement type:



Suivant l'arrangement **C**:



Dans les tables les systèmes sont arrangés dans l'ordre de leurs constituants A dans l'arrangement fixé. On trouvera tous les systèmes ayant le même constituant A, disposés sous ce constituant, arrangés dans l'ordre de leurs constituants B; etc., pour les autres constituants. Afin de faciliter la recherche, il a été inscrit à de fréquents intervalles au haut de la page, les nombres-clés initiaux (pour l'arrangement type) ou le nombre des atomes de carbone (pour l'arrangement **C**) des constituants A. Au moyen de ces nombres, le lecteur trouvera rapidement la page à laquelle est mentionné un système donné.

In die Schlüsselformel müssen die Schlüsselnummern in *absteigender* Reihenfolge geschrieben werden.

Alle chemischen Verbindungen (\mathfrak{B} -Tabellen) sind in der umgekehrten Reihenfolge der Schlüsselformeln angeordnet. Z. B.: um die Verbindung $\text{Hg}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2 = 30-16-2-1$ zu finden, hat man zuerst den Abschnitt 30 aufzusuchen. Dann hat man den Kolonnen der chemischen Verbindungen abwärts zu folgen, bis man zuerst das Element 16 (C) antrifft, von da an setzt man weiter fort, bis das Element 2 (H) gefunden ist und dann weiter, bis das Element 1 (O) erreicht ist. Bei dieser Stelle werden alle Verbindungen gefunden werden, welche sich aus den 4 Elementen Hg, C, H, und O zusammensetzen. Diese Verbindungen sind in deutlicher Art, entsprechend der Bezeichnungsweise chemischer Formeln, angeordnet. Um den Gebrauch der Tafeln möglichst zu erleichtern, sind die Schlüsselnummern häufig an verschiedenen Stellen eingefügt. Sie befinden sich entweder am Kopf der Seiten, oder auf der linken Seite unten, oder an beiden Stellen.

Um eine chemische Verbindung zu suchen, *benütze man immer die \mathfrak{B} -Tabellen*: die *alle* chemischen Verbindungen enthalten, ausgenommen jene der radioaktiven Elemente. Von diesen sind in den \mathfrak{B} -Tabellen nur die Verbindungen des U, Th und Ra enthalten. Für die anderen, *siehe* Bd. I, Seite 364. In einigen \mathfrak{B} -Tabellen, dort wo die Schlüsselnummern mit 16 beginnen, findet man häufig nur einige wenige einfache Verbindungen. Der Leser wird dann auf die \mathfrak{C} -Tabellen verwiesen, wo die restlichen derartigen Verbindungen gefunden werden können. Diese Tabellen sind nach anderen Gesichtspunkten zusammengestellt. Es ist das die

\mathfrak{C} -Anordnung (\mathfrak{C} -Arrangement)

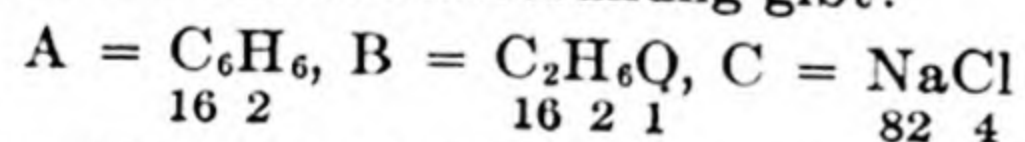
Bei dieser Anordnung sind die Verbindungen nach ihrer empirischen Formel gegeben (einschliesslich Kristallwasser) und zwar in der Ordnung C, H, die restlichen Zeichen dann in alphabetischer Ordnung, z.B. $\text{C}_6\text{H}_4\text{I}_2\text{O}_3\text{S}$. Die \mathfrak{C} -Tabellen enthalten jedoch keine Kohlenstoffverbindung, in deren Schlüsselformel eine Zahl grösser als 16 vorkommt.

SYSTEME MIT MEHR ALS EINER KOMPONENTE

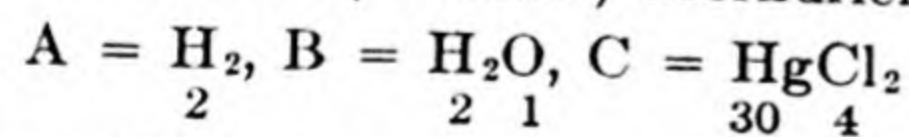
Fall I.—Die Natur der A-Komponente ist nicht besonders gekennzeichnet

Auffindung eines gegebenen Systems: Man ordne zuerst die Komponenten des Systems nach den diesen Tafeln zugrunde gelegten Anordnung (das ist entweder die Standardanordnung oder die \mathfrak{C} -Anordnung, wie gerade der Fall vorliegt).

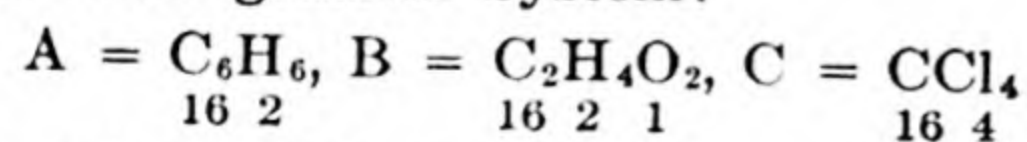
Beispiel: Man hat das System Natriumchlorid, Äthylalkohol, Benzol, von dem die Standardanordnung gibt:



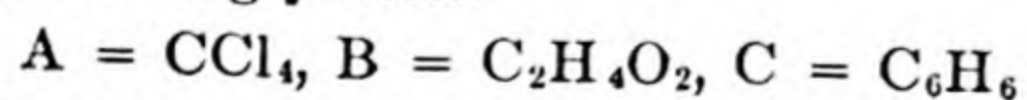
Für das System Wasserstoff, Wasser, Merkurichlorid, hat man:



Für das System Essigsäure, Benzol, Kohlenstofftetrachlorid erhält man nach dem gleichen System:



Nach der \mathfrak{C} -Anordnung jedoch:



In den Tafeln sind die Systeme in der Reihenfolge ihrer A-Komponenten nach der gegebenen Anordnung gereiht. Alle Systeme welche dieselbe A-Komponente besitzen werden unter dieser Komponente gefunden, die nach der B-Komponente gereiht sind. Das gleiche gilt für die anderen Komponenten. Um den Gebrauch der Tafeln zu erleichtern, sind für die Standardanordnung die Schlüsselzahlen, oder für die \mathfrak{C} -Anordnung die Zahl der Kohlen-

Nella formula chiave, i numeri chiave devono essere scritti *in ordine decrescente*.

Tutti i composti in tutte le tabelle (Tabelle \mathfrak{B}) sono disposti nell'ordine numerico inverso delle loro formule chiavi. Supponiamo ad es. di voler trovare il composto $\text{Hg}(\text{C}_{18}\text{H}_{33}\text{O}_2)_2 = 30-16-2-1$. Prima si cerca la sezione 30 della tabella, poi si scorre la colonna delle formule fino ad incontrare l'elemento 16 (C). Da questo punto si continua finchè si trova l'elemento 2 (H), e quindi fino a raggiungere l'elemento 1 (O). Qui si trovano tutti i composti risultanti dai quattro elementi Hg, C, H e O ordinati secondo gli indici delle formule. Per facilitare l'uso delle tabelle i numeri chiave sono inseriti ad intervalli frequenti nella testata o lungo il margine sinistro della pagina, o nell'una e nell'altro.

Per cercare un composto bisogna *sempre consultare la Tabella \mathfrak{B}* che contiene *tutti* i composti tranne quelli degli elementi radioattivi; di questi sono riportati nella Tabella \mathfrak{B} soltanto i composti di U, Th, Ra. Per gli altri, *vedi* Vol. I, p. 364. In alcune Tabelle \mathfrak{B} , laddove si trovano formule chiave che cominciano con 16, si troveranno spesso soltanto pochi composti fra i più semplici e il lettore sarà rimandato a una Tabella \mathfrak{C} dove si troveranno gli altri disposti con criterio differente che viene chiamato

La Disposizione \mathfrak{C}

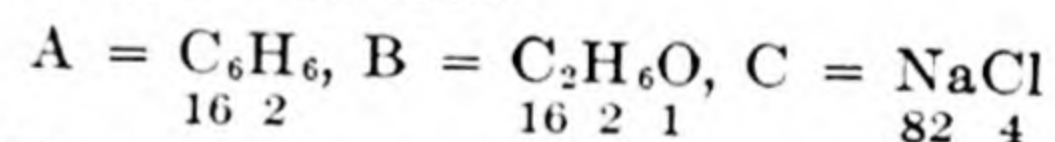
Secondo questa i composti sono disposti in base alle formule empiriche (*compresa* l'acqua di cristallizzazione) nell'ordine C, H e con i rimanenti simboli ordinati alfabeticamente, p. es. $\text{C}_6\text{H}_4\text{I}_2\text{O}_3\text{S}$. Le Tabelle \mathfrak{C} non comprendono però composti del carbonio che hanno un numero chiave più grande di 16.

SISTEMI CON PIÙ DI DUE COMPONENTI

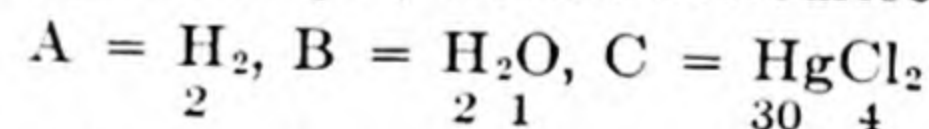
Caso I.—La natura del componente A non è specificatamente indicata

Per trovare un dato sistema si dispongono i componenti seguendo l'ordine stabilito per la tabella (cioè l'ordinamento standard o quello \mathfrak{C} a seconda del caso).

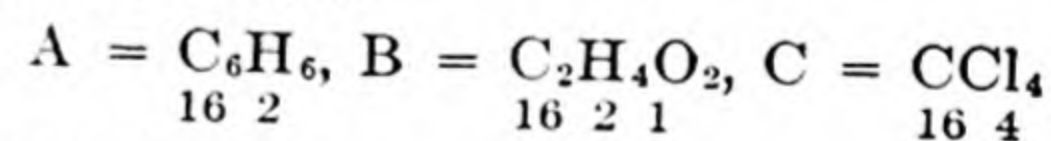
Esempio: Per il sistema cloruro di sodio, alcool etilico, benzolo, l'ordinamento standard sarebbe:



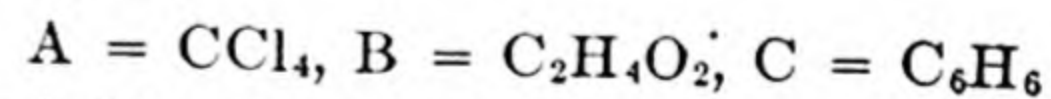
Per il sistema idrogeno, acqua, cloruro mercurico:



Per il sistema acido acetico, benzolo, tetrachloruro di carbonio, nell'ordinamento standard:



Nell'ordinamento \mathfrak{C} :



Nella tabella i sistemi sono disposti secondo l'ordine che compete al componente A nell'ordinamento seguito. Tutti i sistemi con lo stesso componente A si trovano sotto quel componente disposti nell'ordine dei componenti B. E così per tutti gli altri componenti. Per facilitare l'uso delle tabelle, i numeri chiave iniziali (per l'ordinamento standard), o il numero di atomi di carbonio del componente A (per l'ordinamento \mathfrak{C}), sono riportati spesso nella testata della pagina. Con l'uso di questi numeri il lettore potrà arrivare facilmente alla pagina dove deve ricercare un dato sistema.

Caso II.—Il componente A è specificatamente designato

Nel Caso I è necessario servirsi dell'ordinamento stabilito per fissare il componente A del sistema. In molti casi però questo non è necessario, perchè la natura del componente A è spesso designata in modo specifico per certe tabelle. Così nel capitolo

instances this is not necessary, however, since the nature of the A-component is frequently specifically designated for certain tables. Thus for the systems in the section on the solubility of gases in liquids the dissolving gas is designated as the A-component; for the systems in the sections on distribution of a solute between two non-miscible solvents, the distributed substance is designated as the A-component; for certain two-component systems composed of a substance (1) whose key-formula does not begin with 16 and a substance (2) whose key-formula begins with 16, the former (1) is arbitrarily designated as the A-component, etc.

Just as in Case I, the systems with specifically designated A-components are arranged in the order of these A-components according to the arrangement stated at the head of the table.

Example: The density or coefficient of thermal expansion of a liquid solution of 2-hydroxytoluene in benzene under atmospheric pressure is desired.

1. Consult the table of contents, p. xiv. It is evident that the information sought can belong only in the chapter entitled "*P-V-T Relations for one-phase systems*," p. 1.

2. Turn to p. 1 and glance through the main headings and then the appropriate sub-heads until the correct section is located which will obviously be thus:

(a) **Systems of more than one component.**

(b) *The liquid state under atmospheric pressure.*

(c) Non-aqueous solutions.

(d) Non-metallic liquids, p. 130.

3. Turn to p. 130, and similarly scan the table of contents there given, locating the appropriate section thus:

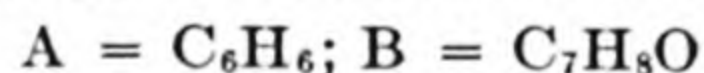
(a) All components of the system are chemical compounds.

(b) All components have key-formulae beginning with 16.

(c) Two-component systems, p. 143.

In locating this final section it is necessary first to write the key-formulae of the components of the system, or at least to determine whether one or both key formulae begin or do not begin with 16. In the present example both formulae obviously begin with 16 and we therefore:

4. Turn to p. 143. Here we find a table for which the arrangement stated is the \mathcal{C} -arrangement. With the aid of the name index in Vol. I, p. 280 (or from some other source of formulae for organic compounds) we obtain the empirical formulae of our two components, which when listed in the \mathcal{C} -arrangements give us:



5. With the aid of the running heads at the tops of the pages we then turn readily to the C_6 and then to the C_6H_6 page (p. 179) and on p. 179 we readily locate C_6H_6 in large bold-face type. We also note carefully that there is given in this type face only one compound of this formula.

6. Under C_6H_6 are listed a series of B-components in the \mathcal{C} -arrangement among which we finally locate (Item No. 889) on p. 179 the desired system, *i.e.*, $B = C_7H_8O$, *o*-Cresol, which name is a synonym for 2-hydroxytoluene.*

Cas II. Le constituant A est spécifiquement désigné

Dans le Cas I il est nécessaire d'utiliser l'arrangement fixé afin de déterminer le constituant A du système. Dans plusieurs circonstances ceci n'est cependant pas nécessaire, car la nature du constituant A est fréquemment spécifiquement désignée pour certaines tables. Ainsi pour les systèmes dans la section relative à la solubilité des gaz dans les liquides, le gaz dissout est désigné comme constituant A. Pour les systèmes dans la section relative à la distribution d'un corps dissout entre deux dissolvants non miscibles, la substance distribuée est désignée comme constituant A; pour certains systèmes à deux constituants composés d'une substance (1) dont la formule-clé ne commence pas par 16 et d'une substance (2) dont la formule-clé commence par 16, la première (1) est arbitrairement désignée comme constituant A, etc.

De même que dans le Cas I, les systèmes à constituants A spécifiquement désignés, sont arrangés dans l'ordre de ces constituants A en accord avec l'arrangement fixé au début de la table.

Exemple: On désire connaître la densité ou le coefficient de dilatation thermique d'une solution liquide de 2-hydroxytoluène dans le benzène à la pression atmosphérique.

1. Consulter la table des matières p. xiv. Il est évident que l'information cherchée ne peut se trouver qu'au chapitre intitulé "*Relations entre P-V-T pour des systèmes à une phase*," p. 1.

2. À la page 1 on parcourra des yeux les titres principaux et ensuite les sous-titres appropriés jusqu'à ce qu'on localise la section convenable. C'est ainsi qu'on trouvera:

(a) **Systèmes de plus d'un constituant.**

(b) *L'état liquide à la pression atmosphérique.*

(c) Solutions non-aqueuses.

(d) Liquides non-métalliques, p. 130.

3. Chercher la p. 130 et d'une façon similaire parcourir la table des matières qui s'y trouve afin de déterminer la section cherchée, ainsi:

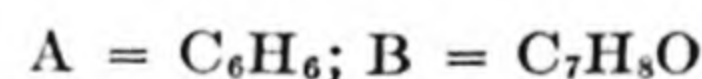
(a) Tous les constituants du système sont des composés chimiques.

(b) Tous les constituants possèdent une formule-clé commençant par 16.

(c) Systèmes à deux constituants, p. 143.

Pour pouvoir localiser cette section finale il est alors nécessaire d'écrire la formule-clé des constituants du système ou au moins de déterminer si la formule-clé de l'un de ceux-ci ou si les deux formules commencent ou non par 16. Dans le présent exemple il est évident que les deux formules commencent par 16.

4. On cherche donc la p. 143. On y trouve une table pour laquelle l'arrangement fixé est l'arrangement \mathcal{C} . Au moyen de l'index des noms dans le Vol. I, p. 280 (ou à partir d'une autre source de formules pour composés organiques) on obtient la formule empirique de nos deux constituants qui disposés suivant l'arrangement \mathcal{C} donnent:



5. À l'aide des rappels qui se trouvent au haut des pages, on trouve rapidement C_6 et ensuite la page C_6H_6 (p. 179) et on situe de suite C_6H_6 écrit en gros caractères gras à la page 179. On note soigneusement qu'il n'est imprimé en ce genre de caractères qu'un seul composé de cette formule.

6. Sous C_6H_6 , les différents constituants B sont disposés suivant l'arrangement \mathcal{C} et parmi ceux-ci on trouve finalement (article N° 889) à la p. 179, le système désiré, c'est à dire $B = C_7H_8O$, *o*-crésol dont le nom est un synonyme de 2-hydroxytoluène.*

*Not infrequently the name in the table may be a synonym of the one sought.

*Il n'est pas rare que le nom dans la table puisse être un synonyme de celui qu'on cherche.

stoffatome der A-Komponente in kurzen Abständen am Kopfe der Seite angebracht. Beim Gebrauch dieser Zahlen wird der Leser im Stande sein, rasch die Seite aufzuschlagen auf welcher das gesuchte System gefunden werden kann.

Fall II.—Die A-Komponente ist besonders gekennzeichnet

Im Fall I ist es notwendig die Standardanordnung zu gebrauchen, um die A-Komponente des Systems festzulegen. In vielen Fällen ist dies doch nicht notwendig, da die A-Komponente in bestimmten Tafeln besonders gekennzeichnet ist. So ist in dem Abschnitt über die Löslichkeit der Gase in Flüssigkeiten, das sich lösende Gas als A-Komponente angeführt; in dem Abschnitt weiters, über die Verteilung eines gelösten Stoffes zwischen zwei nicht mischbaren Flüssigkeiten, ist der sich verteilende Stoff als A-Komponente angeführt. Ferner ist in gewissen Zwei-Komponenten Systemen die aus einem Stoff (1) bestehen, dessen Schlüssel-formel nicht mit 16 beginnt und einem Stoff (2) dessen Schlüssel-formel mit 16 beginnt, der Stoff (1) willkürlich als A-Komponente bezeichnet; u.s.w.

Genau so wie im Fall I sind die Systeme mit näher gekennzeichneten A-Komponente, nach der am Kopfe der Tafeln angegebenen Anordnung nach der A-Komponente gereiht.

Beispiel: Es ist die Dichte oder der thermische Ausdehnungskoeffizient einer flüssigen Lösung von 2-Hydroxytoluol in Benzol unter Atmosphären Druck aufzufinden.

1. Man sehe zuerst das Inhaltsverzeichnis, S. xiv an. Es ist klar, dass die gesuchte Grösse nur zu dem Kapitel "*P-V-T* Beziehungen für Einphasen-Systeme," S. 1 gehören kann.

2. Man schlage S. 1 auf und sehe die Kopftitel und die dazugehörigen Untertiteln durch, bis der richtige Abschnitt von der folgenden Art festgestellt ist:

(a) Systeme mit mehr als einer Komponente.

(b) Flüssiger Zustand unter Atmosphären Druck.

(c) Nichtwässrige Lösungen.

(d) Nichtmetallische Flüssigkeiten, S. 130.

3. Man schlage S. 130 auf und prüfe in gleicher Weise das hier gegebene Inhaltsverzeichnis nach dem bezüglichen Abschnitt:

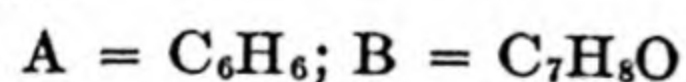
(a) Alle Komponenten des Systems sind chemische Verbindungen.

(b) Die Schlüssel-formeln aller Komponenten beginnen mit 16.

(c) Zwei-Komponenten Systeme, S. 143.

Um diesen letzten Abschnitt zu bestimmen, ist es notwendig zuerst die Schlüssel-formeln der Komponenten des Systems niederzuschreiben, oder mindestens zu bestimmen, ob die Schlüssel-formel der einen oder beider Komponenten mit 16 beginnt oder nicht. In dem gegenwärtigen Beispiel beginnen selbstverständlich beide Formeln mit 16 und man wendet sich deshalb:

4. Auf S. 143. Hier findet man eine Tafel für welche die angegebene Anordnung die \mathcal{C} -Anordnung ist. Mit Hilfe des Namen-Verzeichnisses, Band I, S. 280 (oder aus einer andern die Formel der chemischen Verbindung liefernden Quelle) erhält man die empirische Formel unserer zwei Komponenten, die in der \mathcal{C} -Anordnung angeführt lauten:



5. Mit Hilfe der fortlaufenden Hauptzeichen am Kopfe der Seiten findet man leicht zur C_6 und dann zur C_6H_6 Seite (S. 179). Auf S. 179 kann man leicht C_6H_6 in grossen fettgedruckten Zeichen auffinden. Man stelle mit Vorsicht auch fest, dass in dieser Zeichenart nur eine Komponente dieser Formel vorkommt.

6. Unter C_6H_6 sind eine Serie von B-Komponenten in der \mathcal{C} -Anordnung gereiht, unter denen wir schliesslich (Item No. 889) auf S. 179 das gesuchte System, $B = C_7H_8O$, *o*-Cresol feststellen, ein für 2-Hydroxytoluol gleiches bezeichnender Name.*

* Es wird nicht selten der in der Tafel vorkommende Namen mit dem gesuchten nicht gleichlauten.

riguardante la solubilità dei gas nei liquidi, il gas che si discioglie è considerato come componente A; nel capitolo riguardante la distribuzione di un soluto fra due solventi non miscibili, la sostanza disciolta è indicata come componente A; per certi sistemi a due componenti risultanti di una sostanza (1) la cui formula chiave non comincia con 16, e una sostanza (2) con formula chiave che comincia con 16, la prima (1) è arbitrariamente designata come componente A, ecc.

Come nel Caso I i sistemi con componenti A indicati in modo specifico sono ordinati secondo questi componenti A in accordo con l'ordinamento stabilito in testa alla tabella.

Esempio: Si desideri la densità o il coefficiente di dilatazione termica di una soluzione liquida di 2-idrossitoluolo in benzolo alla pressione atmosferica.

1. Si consulta l'indice a page xiv. È evidente che la notizia che si cerca si trova solo nel capitolo "*Relazioni fra P-V-T* nei sistemi monofasi," a pag. 1.

2. Si cerca a p. 1 e si guarda tra le intestazioni principali secondarie fino a trovare il capitolo esatto:

(a) Sistemi con più di un componente.

(b) Liquidi alla pressione atmosferica.

(c) Soluzioni non acquose.

(d) Liquidi non metallici, p. 130.

3. Si cerca a pag. 130 e si esamina l'indice. Si trova:

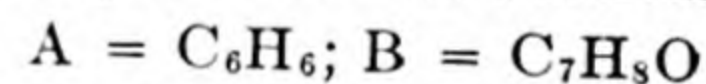
(a) Tutti i componenti del sistema sono composti.

(b) La formula chiave di tutti i componenti comincia con 16.

(c) Sistemi a due componenti, p. 143.

Per trovare questo capitolo finale è necessario scrivere prima la formula chiave dei componenti o almeno determinare se una sola delle due formule chiave o entrambe cominciano con 16. Nell'esempio di cui si tratta entrambe le formule cominciano con 16 e perciò:

4. Si passa a p. 143. Qui si trova una tabella nella quale l'ordinamento seguito è quello \mathcal{C} . Per mezzo dell'indice dei nomi nel Vol. I, pag. 280 (oppure con un altro elenco di formule di composti organici) si ottengono le formule empiriche dei nostri due componenti, i quali, disposti secondo l'ordinamento \mathcal{C} ci danno:



5. Con l'aiuto delle intestazioni a capo delle pagine si passa allora facilmente alla pagina con C_6 e quindi con C_6H_6 (p. 179) e a p. 179 si trova agevolmente C_6H_6 stampato in carattere grosso. In questo carattere è riportato solo un composto di questa formula.

6. Sotto C_6H_6 è elencata una serie di componenti B nell'ordinamento \mathcal{C} , e tra essi alla fine troviamo a pag. 179 il sistema cercato (Item N° 889) cioè $B = C_7H_8O$ *o*-cresolo, sinonimo di 2-idrossitoluolo.*

* Spesso il nome della tabella può essere un sinonimo di quello cercato.

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INTERNATIONAL CRITICAL TABLES

P-V-T RELATIONS FOR ONE-PHASE SYSTEMS

(DENSITY, SPECIFIC GRAVITY, THERMAL EXPANSION AND COMPRESSIBILITY)

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* See also Vol. I, p. 102.

† This chapter covers only data showing the variation of density or volume with temperature. For additional density data at single temperatures, see Vol. I, p. 98-314 and 338-347.

* Voir aussi Vol. I, p. 102.

† Ce chapitre ne comprend que les données indiquant la variation de la densité ou du volume avec la température. Pour d'autres données de densité à une seule température, voir Vol. I, p. 98-314 et 338-347.

* Siehe auch Bd. I, S. 102.

† Dieser Abschnitt enthält nur Angaben über die Änderung der Dichte oder des Volumens mit der Temperatur. Weitere Angaben über Dichten bei einzelnen Temperaturen, siehe Bd. I, S. 98-314 und 338-347.

* Vedi anche Vol. I, p. 102.

† Questo capitolo contiene solo notizie sulla variazione della densità e del volume in funzione della temperatura. Per ulteriori notizie sulle densità a singole temperature, vedi Vol. I, p. 98-314 e 338-347.

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† See also Vol. I, p. 98-314 and 338-347.

† Voir aussi Vol. I, p. 98-314 et 338-347.

† Siehe auch Bd. I, S. 98-314 und 338-347.

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P-V-T RELATIONS IN THE GASEOUS STATE FOR SUBSTANCES WHICH ARE GASES AT 0° AND 1 ATMOSPHERE

S. F. PICKERING

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PART I. STANDARD DENSITY

$$1 + \lambda = \frac{p_0 v_0(0^\circ, 0_{\text{atm}})}{p_1 v_1(0^\circ, 1 \text{ Atm})} \quad v_0 = \frac{M(1 + \lambda)}{d_s}$$

Formula	Formula weight, M	d_s, gl^{-1} 0°, 1 Atm	Lit.	$1 + \lambda$	Lit.	v_0
A-Table.—Elements and Atmospheric Air						
A	39.91	1.7832	(55, 71, 112, 124)	1.00090	(54, 55, 100)	22.401
Cl ₂	70.916	3.214	(61)			
F ₂	38.000	1.696	(78)			
H ₂	2.0154	0.08988	(42, 92, 93, 131)	0.99939	(44, 49, 51, 54, 99, 138)	22.410
He	4.00	0.1785	(16, 42, 50, 131, 140)	0.99954	(49, 54, 55, 97)	22.398
Kr	82.9	3.708	(91, 139)			
N ₂ (chem.)	28.016	1.25057	(37, 82, 87, 88, 146)	1.00047	(49, 52, 54, 74, 125, 146)	22.413
N ₂ (atm.)		1.2568	(107)			
Ne	20.2	0.9002	(139)	0.9996	(53, 54, 101)	22.430
O ₂	32.00	1.42904	(15, 22, 34, 37, 58, 60, 69, 84, 89, 90, 92, 94, 114, 122, 134, 145, 153)	1.00094	(10, 44, 52, 59, 67, 74, 145)	22.4137
Rn	222	9.73	(38)			
Xe	130.2	5.851	(91, 139)			
Air		1.2929	(34, 35, 41, 46, 68, 86, 107, 114, 136)	1.00061	(54, 55)	

B-Table.—Chemical Compounds

Standard arrangement (v. p. viii)

Cl ₂ O	86.916	3.89	(33)			
HCl	36.4657	1.6392	(24, 122)	1.0074	(123)	22.411
HBr	80.9237	3.6445	(80, 120)	1.00929	(80, 120)	22.411
HI	127.9397	5.7891	(30, 148)	1.015	(148)	22.432
SO ₂	64.065	2.9269	(40, 122)	1.0240	(11, 59)	22.414
H ₂ S	34.0804	1.539	(12)	1.010	(74)	22.369
H ₂ Se	81.2154	3.670	(23)	1.012	(23)	22.391
H ₂ Te	129.5154	4.49*	(32)			
NO	30.008	1.3402	(37, 45, 122)	1.0011	(5, 9, 59, 123)	22.420
N ₂ O	44.016	1.9778	(47, 77, 116)	1.0074	(9, 39, 117)	22.420
NH ₃	17.0311	0.7710	(48, 75, 110, 122, 154)	1.0151	(74)	22.423
NOCl	65.466	2.992	(143)			
PH ₃	34.0471	1.5294	(132)			
PF ₃	126.024	5.81	(76)			
POF ₃	104.024	4.8	(77)			
AsH ₃	77.9831	3.48	(31)			
SbH ₃	124.7931	5.30†	(127)			
CO	28.000	1.2504	(77, 115)	1.0005	(123)	22.404
CO ₂	44.000	1.9769	(27, 48, 68, 115, 119)	1.00706	(44)	22.414
CH ₄	16.0308	0.7168	(13, 64)	1.0024	(64)	22.418
C ₂ H ₂	26.0154	1.173	(126, 150)	1.010	(57, 150)	22.400
C ₂ H ₄	28.0308	1.2604	(4)	1.00780	(9, 44)	22.413
C ₂ H ₆	30.0462	1.3566	(13, 126)			
C ₃ H ₈	44.0616	2.020	(135)			
iso-C ₄ H ₁₀	58.077	2.673	(106)			
(CH ₃) ₂ O	46.0462	2.1098	(6, 11)	1.0254	(7, 9)	22.379
CH ₃ F	34.0231	1.5452	(85)	1.0181	(83)	22.416
CH ₃ Cl	50.4811	2.3076	(8, 11, 144)	1.0244	(8, 11, 14, 144)	22.410

Formula	Formula weight, M	d_s, gl^{-1} 0°, 1 Atm	Lit.
iso-C ₄ H ₉ F	92.5273	2.58‡	(79)
COS	60.065	2.72	(133)
CH ₃ NH ₂	31.0465	1.396	(95)
(CH ₃) ₂ NH	45.0619	1.966§	(95)
(CH ₃) ₃ N	59.0773	2.580§	(95)
SiH ₄	32.0908	1.44	(128)
Si ₂ H ₆	62.1662	2.85	(128)
SiF ₄	104.06	4.684	(36)
SiH ₃ Cl	66.5411	3.03	(129)
SiH ₃ (CH ₃)	46.1062	2.08	(129)
SiH ₂ (CH ₃) ₂	60.1216	2.73	(129)
SiH ₂ Cl(CH ₃)	80.5565	3.64	(129)
SiHCl ₂ (CH ₃)	115.0068	5.3	(129)
GeH ₄	76.4108	3.420	(26)
(CH ₃) ₃ B	55.8893	2.52	(130)

* 3°/air 3°. † 15°, 754 mm. ‡ 21°/air 21°. § 17°.

PART II. THERMAL EXPANSION AND COMPRESSIBILITY

 $\alpha_{v,t} = \frac{v - v_0}{tv_0}$, the coefficient of expansion at constant pressure,

 p_0 , between 0° and t , °C

 $\beta_{v,t} = \frac{p - p_0}{tp_0}$, the coefficient at constant volume, v_0 , between 0°
and t , °CA-Table.—Elementary Substances and Atmospheric Air
A, Argon

p, m Hg	100 α (53, 55)					
	0 to 50°C	0 to 100°C	0 to 150°C	0 to 200°C	0 to 300°C	0 to 400°C
0					0.3660	0.3660
1	0.3678	0.3676	0.3675	0.3673	0.3672	0.3671
5					0.3716	0.3711
10	0.3826	0.3804	0.3793	0.3780	0.3772	0.3761
15					0.3826	0.3811
20	0.4004	0.3955	0.3930	0.3903	0.3881	0.3860
25					0.3934	0.3908
30	0.4176	0.4104	0.4064	0.4026	0.3986	0.3955
35					0.4038	0.4001
40	0.4348	0.4251	0.4195	0.4146	0.4089	0.4047
45					0.4138	0.4091
50	0.4507	0.4390	0.4321	0.4259	0.4187	0.4135
55					0.4235	0.4177
60	0.4662	0.4525	0.4442	0.4369	0.4282	0.4218
65					0.4327	0.4259
70	0.4813	0.4656	0.4556	0.4473	0.4371	0.4298
75	0.4886	0.4720	0.4610	0.4524	0.4415	0.4336
80					0.4456	0.4372

$\frac{1}{v}$	100 β (53, 55)					
	0 to 50°C	0 to 100°C	0 to 150°C	0 to 200°C	0 to 300°C	0 to 400°C
0					0.3660	0.3660
1	0.3676	0.3675	0.3675	0.3674	0.3674	0.3674
5					0.3728	0.3727
10	0.3801	0.3794	0.3796	0.3790	0.3796	0.3794
15					0.3863	0.3860

A, Argon.—(Continued)

1 <i>v</i>	100β (53, 55)					
	0 to 50°C	0 to 100°C	0 to 150°C	0 to 200°C	0 to 300°C	0 to 400°C
20	0.3957	0.3940	0.3937	0.3930	0.3931	0.3926
25					0.3998	0.3991
30	0.4109	0.4085	0.4081	0.4070	0.4066	0.4055
35					0.4112	
40	0.4255	0.4228	0.4224	0.4209	0.4158	
50	0.4397	0.4371	0.4360			
60	0.4539					
65	0.4609					

100β = 0.3671, 0 to 20°, *p* at 0° = 0.76 m (100).

<i>p</i> , kg/cm ²	<i>v</i> ₃₀₀₀ - <i>v</i> _{<i>p</i>} , cm ³ /g	<i>p</i> , kg/cm ²	<i>v</i> ₃₀₀₀ - <i>v</i> _{<i>p</i>} , cm ³ /g	<i>p</i> , kg/cm ²	<i>v</i> ₃₀₀₀ - <i>v</i> _{<i>p</i>} , cm ³ /g	Lit.
2 000	-0.083	6 000	0.112	11 000	0.190	
2 500	-0.034	7 000	0.134	12 000	0.201	(19, 20)
3 000	0.000	8 000	0.152	13 000	0.209	
4 000	+0.049	9 000	0.167	14 000	0.217	
5 000	0.085	10 000	0.180	15 000	0.224	

p in atm.; *v* = 1.0000 at 0°C and 1 atm.; range, 0 to 100 atm. (53, 54, 55)

-100°C	$pv = 0.6346 - 0.02872p - 0.041021p^2 - 0.09130p^4$
-50°C	$pv = 0.8178 - 0.021687p + 0.0679p^2 + 0.09100p^4$
0°C	$pv = 1.0010 - 0.03986p + 0.05237p^2$
+50°C	$pv = 1.1842 - 0.03492p + 0.05179p^2$
100°C	$pv = 1.3674 - 0.03192p + 0.05161p^2$
150°C	$pv = 1.5506 + 0.0452p + 0.05124p^2$
200°C	$pv = 1.7338 + 0.03208p + 0.05112p^2$
300°C	$pv = 2.1002 + 0.03501p + 0.0646p^2$
400°C	$pv = 2.4666 + 0.03683p$

Leiden Temperature Scale (v. Vol. I, p. 54)

v = 1.0000 at 0°C and 1 atm. (100)

<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>
+20.39°C		+18.39°C		0.00°C		-57.72°C	
21.783	1.0627	37.264	1.0526	20.576	0.9856	17.872	0.7602
27.320	1.0606	49.586	1.0471	26.070	0.9808	25.228	0.7465
34.487	1.0582	62.489	1.0405	31.572	0.9774	35.127	0.7300
37.673	1.0535			36.743	0.9725	46.209	0.7115
49.604	1.0483			49.871	0.9620	62.079	0.6845
61.741	1.0420			62.230	0.9526		
-87.05°C		-102.51°C		-109.88°C		-113.80°C	
16.178	0.6432	14.864	0.5813	14.443	0.5504	31.001	0.4622
21.651	0.6282	19.790	0.5642	18.653	0.5359	38.005	0.4276
33.296	0.5965	32.394	0.5205	31.515	0.4838	42.682	0.4001
41.094	0.5752	40.976	0.4878	39.166	0.4493	47.655	0.3689
51.533	0.5446	45.088	0.4706	43.718	0.4254	51.752	0.3389
61.830	0.5159	51.398	0.4435	49.515	0.3944	52.188	0.3358
		56.882	0.4194	54.250	0.3658	55.763	0.3062
		62.239	0.3939	59.616	0.3297	55.991	0.3030
						58.898	0.2765
-115.86°C		-115.86°C		-116.62°C		-116.62°C	
31.323	0.4478	53.204	0.2957	13.863	0.5235	46.496	0.3478
37.788	0.4138	57.493	0.2442	17.697	0.5065	50.259	0.3147
41.908	0.3880	61.626	0.1929	30.681	0.4470	50.447	0.3119
46.648	0.3547			37.250	0.4113	54.922	0.2615
50.324	0.3244			41.943	0.3806	60.669	0.1831

<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>
-119.20°C		-119.20°C		-120.24°C		-120.24°C	
13.766	0.5123	43.006	0.3441	30.809	0.4242	47.705	0.2877
17.378	0.4970	47.272	0.3023	33.776	0.4078	50.351	0.2438
30.303	0.4299	51.679	0.2321	37.836	0.3812	52.253	0.1864
34.052	0.4090	53.044	0.1929	41.668	0.3516	53.191	0.1569
37.641	0.3887	54.244	0.1610	44.510	0.3265		
37.923	0.3836						
-121.21°C		-130.38°C		-139.62°C		-149.60°C	
13.754	0.5033	12.773	0.4662	11.986	0.4262	11.150	0.3820
17.225	0.4882	15.664	0.4511	14.586	0.4100	12.788	0.3691
30.122	0.4215	22.861	0.4096				
34.070	0.3981	25.519	0.3918				
37.465	0.3734	28.878	0.3711				
45.282	0.3040						
47.094	0.2769						
49.865	0.2130						
50.885	0.1525						

H₂, Hydrogen

<i>p</i> , kg/cm ²	<i>(v</i> ₃₀₀₀ - <i>v</i> _{<i>p</i>}) cm ³ /g		$\frac{(pv)_{t,p}}{(pv)_{0,1}}$ (19, 20)	
	30°C	65°C	30°C	65°C
2 000	-2.25		2.43	
3 000	0.00	0.00	3.04	3.18
4 000	1.12	1.14	3.66	3.84
5 000	1.84	1.88	4.30	4.47
6 000	2.35	2.44	4.85	5.08
7 000	2.77	2.88	5.40	5.66
8 000	3.09	3.21	5.95	6.23
9 000	3.38	3.46	6.47	6.82
10 000	3.63	3.68	6.97	7.38
11 000	3.86	3.88	7.45	7.93
12 000	4.09	4.04	7.89	8.47
13 000	4.32	4.21	8.28	9.00

* Assuming *v*₃₀₀₀ = 11.64 and 12.17 cm³/g at 30 and 65° respectively (Amagat).

p in atm.; *v* = 1.0000 at 0°C and 1 atm.; range 0 to 100 atm.* (51, 53, 54, 138, 147)

-207.9°C	$pv = 0.2388 - 0.021077p + 0.05242p^2 + 0.062704p^3 - 0.081785p^5$
-183°C	$pv = 0.32995 - 0.03247p + 0.05381p^2$
-150°C	$pv = 0.45065 + 0.03132p + 0.05200p^2$
-100°C	$pv = 0.6336 + 0.03408p + 0.0690p^2$
-50°C	$pv = 0.8165 + 0.03540p + 0.0650p^2$
0°C	$pv = 0.99938 + 0.03624p + 0.0620p^2$
+20°C	$pv = 1.0726 + 0.03645p + 0.0612p^2$
50°C	$pv = 1.1824 + 0.03676p$
100°C	$pv = 1.3653 + 0.03695p$
200°C	$pv = 1.7310 + 0.03701p$

* At 0 and 20° (138) covers a range from 0 to 200 atm.

Leiden Temperature Scale

v = 1.0000 at 0°C and 1 atm. (105)

<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>	<i>p</i> , atm.	<i>pv</i>
-103.57°C		-139.89°C		-182.74°C		-203.97°C	
38.414	0.6376	29.800	0.4954	20.159	0.3274	16.970	0.2425
45.000	0.6402	35.132	0.4976	22.995	0.3272	19.335	0.2412
51.489	0.6433	40.172	0.4991	23.010	0.3273	21.764	0.2400
				26.255	0.3271		
				26.281	0.3271		
				29.530	0.3270		

Leiden Temperature Scale
H₂, Hydrogen.—(Continued)

$v = 1.0000$ at 0°C and 1 atm.
(105).—(Continued)

p , atm.	pv	p , atm.	pv
-212.73°C		-217.32°C	
14.571	0.2074	13.288	0.1889
16.539	0.2057	15.052	0.1871
18.443	0.2039	16.812	0.1851
		13.199	0.1890
		14.875	0.1872
		16.558	0.1853
-225.37°C		-231.38°C	
10.898	0.1566	9.472	0.1315
12.424	0.1541	10.291	0.1296
13.685	0.1520	11.402	0.1268
-236.28°C		-238.29°C	
8.298	0.1106	8.083	0.1007
8.663	0.1093	8.310	0.0998
9.496	0.1065	8.715	0.0981
-239.90°C		-241.88°C	
7.512	0.0940	6.821	0.0858
7.843	0.0924	6.820	0.0858
8.155	0.0910	7.117	0.0840

p , atm.	pv
-243.88°C	
6.191	0.0767
6.192	0.0767
6.392	0.0752
6.604	0.0735
6.619	0.0734

$pv = 1.0000$ at 0°C and 1 atm.
(29)

p , atm.	pv	p , atm.	pv
-217.33°C		-225.36°C	
34.24	0.1695	28.75	0.1280
36.98	0.1677	33.38	0.1231
40.21	0.1659	36.83	0.1205
44.09	0.1645	38.13	0.1198
48.33	0.1637	39.51	0.1192

Virial Coefficients of Hydrogen

$pv = A + B/v$; Leiden temperature scale; $v = 1.00000$ at 0°C and 1 atm. (1)

T , °K	A	B
90.23	0.33019	-0.000120
69.86	0.25562	-0.000194
20.55	0.07518	-0.000470
20.53	0.07516	-0.000474
18.16	0.06647	-0.000505
16.65	0.06094	-0.000527
15.64	0.05725	-0.000553
14.50	0.05306	-0.000581
18.22	0.06666	-0.000506

$pv = 1.0000$ at 0°C and 1 atm.
(29).—(Continued)

p , atm.	pv	p , atm.	pv
-217.33°C		-225.36°C	
53.52	0.1635	43.47	0.1185
56.52	0.1642	48.68	0.1191
		55.85	0.1225
-231.40°C		-236.31°C	
23.44	0.0952	17.91	0.0668
26.40	0.0889	18.62	0.0632
27.43	0.0872	21.89	0.0525
28.54	0.0856	22.45	0.0524
30.28	0.0837	23.00	0.0518
31.11	0.0831	24.11	0.0517
32.29	0.0826	24.83	0.0519
33.38	0.0821	25.98	0.0524
34.64	0.0821	28.12	0.0540
35.79	0.0824	29.65	0.0554
36.18	0.0823	30.00	0.0559
39.42	0.0838	34.77	0.0607
42.37	0.0858	40.64	0.0675
48.60	0.0911		
-238.29°C		-239.91°C	
15.39	0.0542	13.62	0.0288
17.60	0.0401	13.77	0.0286
18.00	0.0391	14.05	0.0286
18.95	0.0390	14.25	0.0286
20.07	0.0395	14.45	0.0286
20.90	0.0402	14.78	0.0288
22.79	0.0420	15.59	0.0294
23.05	0.0421	17.67	0.0317
25.87	0.0453	20.94	0.0357
29.79	0.0499	23.43	0.0388
38.08	0.0598	24.08	0.0396
43.47	0.0665	25.86	0.0419
45.50	0.0690	28.76	0.0455
-239.92°C		29.25	0.0462
12.96	0.0434	31.62	0.0491
13.01	0.0408	33.05	0.0509
13.03	0.0397	38.38	0.0576
		47.94	0.0693
		51.46	0.0735

Values of pv

Each individual value in this table has been experimentally determined (151, 152, 156)

p , atm.	pv					
	0°	50°	99.85°	198.9°	299.1°	399.3°
1	1.0000					
50	1.0330	1.2182	1.4026	1.7684		
100	1.0639	1.2521	1.4359	1.8030	2.1700	2.5141
200	1.1336	1.3272	1.5105	1.8804	2.2502	2.6054
300	1.2045	1.3986	1.5836	1.9556	2.3240	2.6800
400	1.2775	1.4720	1.6563	2.0295	2.3977	2.7625
600	1.4226	1.6160	1.7999	2.1726	2.5394	
800	1.5665	1.7582	1.9415	2.3157	2.6762	
1000	1.7107	1.9006	2.0839	2.4568	2.8125	

p , atm.	pv (3)		
	0°C	15.4°C	47.3°C
1	1.0000		
500	1.3565		
1000	1.7260	1.7780	1.8930
1100	1.8007	1.8535	1.9635
1200	1.8690	1.9248	2.0334
1300	1.9383	1.9929	2.1027
1400	2.0048	2.0608	2.1714
1500	2.0700	2.1270	2.2395
1600	2.1352	2.1920	2.3072
1700	2.2006	2.2542	2.3732
1800	2.2644	2.3184	2.4372
1900	2.3275	2.3835	2.5004
2000	2.3890	2.4450	2.5614
2100	2.4496	2.5074	2.6229
2200	2.5102	2.5707	2.6840
2300	2.5714	2.6323	2.7473
2400	2.6340	2.6940	2.8092
2500	2.6950	2.7525	2.8700
2600	2.7547	2.8145	2.9289
2700	2.8134	2.8701	2.9889
2800	2.8686	2.9260	3.0464
2900		2.9812	3.1059
3000		3.0375	

p_0 , atm.	100 α (142)				
	0 to +100°C	0 to +20°C	0 to -77°C	0 to -104°C	0 to -147°C
1	0.3661				
5	0.3665	0.3655	0.3658	0.3661	0.3666
10	0.3646	0.3647	0.3652	0.3656	0.3667
15	0.3637	0.3639	0.3646	0.3652	0.3668
20	0.3629	0.3631	0.3640	0.3648	0.3669
25	0.3620	0.3623	0.3635	0.3644	0.3670
30	0.3611	0.3615	0.3629	0.3640	0.3670
35	0.3602	0.3608	0.3623	0.3635	0.3669
40	0.3594	0.3601	0.3618	0.3631	0.3668
45	0.3585	0.3593	0.3613	0.3626	0.3666
50	0.3576	0.3586	0.3608	0.3621	0.3663
55	0.3567	0.3578	0.3602	0.3616	0.3659
60	0.3558	0.3571	0.3596	0.3611	0.3654

H_2 , Hydrogen.—(Continued)

p_0 , atm.	100α (142)			
	0 to -183°C	0 to -190°C	0 to -205°C	0 to -212°C
1				
5	0.3674	0.3678	0.3685	0.3691
10	0.3680	0.3685	0.3701	0.3711
15	0.3688	0.3696	0.3717	0.3732
20	0.3697	0.3707	0.3734	0.3754
25	0.3704	0.3716	0.3751	0.3774
30	0.3710	0.3724	0.3766	0.3792
35	0.3715	0.3731	0.3779	0.3808
40	0.3721	0.3738	0.3789	0.3821
45	0.3724	0.3742	0.3796	0.3830
50	0.3727	0.3746	0.3802	0.3835
55	0.3728	0.3748	0.3806	0.3838
60	0.3728	0.3749	0.3808	0.3841

p_0 ,* atm.	100α (3)			100β (3)		
	0 to 15.4°C	0 to 99.2°C	99.2 to 200.2°C	0 to 15.4°C	0 to 47.3°C	0 to 99.2°C
100	0.360			0.357		0.373
200	0.345	0.332	0.242			0.383
300	0.323	0.314	0.231			0.383
400	0.300	0.295	0.221			0.380
500	0.278	0.278	0.214			0.379
600	0.260	0.261	0.204			0.376
700	0.244	0.249	0.196			0.371
800	0.231	0.237	0.189			
900	0.220	0.226	0.182			
1000	0.210	0.218		0.357	0.347	
1200	0.190			0.346	0.335	
1500	0.176			0.342	0.334	
1800	0.161			0.321	0.318	
2000	0.153			0.321	0.317	
2400	0.141			0.319	0.305	
2500	0.138					
2800	0.131			0.325		
3000	0.128					

* p_0 = constant pressure for α and initial pressure for β .

p , m Hg	100α (49)	100β (49)
	$t = 0^\circ\text{C}$	$t = 0^\circ\text{C}$
ca. 1	0.36604 - 0.00012 p	0.36604 + 0.00017 p

 p , respectively $p_0 = 1$ atm. (70)

100α		100β	
0°C	0 to 100°C	0°C	0 to 100°C
0.3660	0.3661	0.3662	0.3663

p , m Hg	100α (51, 53)		
	0 to 50°C	0 to 100°C	0 to 200°C
0	0.3662	0.3662	0.3660
1	0.3660	0.3660	0.3658
5	0.3654	0.3651	0.3648
10	0.3645	0.3641	0.3635
15	0.3636	0.3630	0.3623
20	0.3626	0.3619	0.3610
25	0.3616	0.3608	0.3597
30	0.3606	0.3596	0.3584
35	0.3596	0.3585	0.3572
40	0.3585	0.3573	0.3559
45	0.3574	0.3561	0.3546
50	0.3563	0.3550	0.3532

p , m Hg	100α (51, 53)		
	0 to 50°C	0 to 100°C	0 to 200°C
55	0.3551	0.3538	0.3520
60	0.3539	0.3525	0.3506
65	0.3526	0.3513	0.3493
70	0.3513	0.3501	0.3480
75	0.3500	0.3488	0.3467
76	0.3498	0.3486	
80			0.3453

$\frac{1}{v}$	100β (51, 53)		
	0 to 50°C	0 to 100°C	0 to 200°C
0	0.3662	0.3662	0.3660
1	0.3663	0.3663	0.3661
5	0.3670	0.3668	0.3665
10	0.3678	0.3674	0.3669
15	0.3685	0.3680	0.3673
20	0.3692	0.3686	0.3677
25	0.3698	0.3691	0.3681
30	0.3704	0.3696	0.3684
35	0.3709	0.3701	0.3688
40	0.3714	0.3705	0.3691
45	0.3719	0.3710	0.3694
50	0.3723	0.3714	
55	0.3726		
60	0.3729		

He, Helium (19, 20)

p , kg/cm ²	$v_{3000} - v_p$, cm ³ /g at 65°C	$v_{95^\circ} - v_{30^\circ}$, cm ³ /g	v_{65° , cm ³ /g*	$\frac{(pv)_t, p}{(pv)_{0, 1}}$ 65°C*
3 000	0.00	0.613	5.54	2.88
4 000	0.77	0.598	4.77	3.29
5 000	1.23	0.589	4.31	3.72
6 000	1.54	0.584	4.00	4.15
7 000	1.77	0.581	3.77	4.56
8 000	1.96	0.579	3.59	4.96
9 000	2.10	0.578	3.44	5.34
10 000	2.22	0.576	3.32	5.73
11 000	2.33	0.575	3.21	6.09
12 000	2.41	0.574	3.13	6.49
13 000	2.48	0.572	3.06	6.88
14 000	2.55	0.571	2.99	7.25
15 000	2.60	0.570	2.94	7.61

* Based on the value of v_{3000} obtained by extrapolation from an unpublished equation of Keyes (63.5). p in atm.; $v = 1.0000$ at 0°C and 1 atm.; range, 0 to 105 atm. (52, 53, 54, 147)

-258.0°C	$pv = 0.05558 - 0.03797p + 0.045437p^2 - 0.067513p^3 + 0.083796p^4$
-252.8°C	$pv = 0.07460 - 0.031642p + 0.041853p^2 - 0.061105p^3$
-208.0°C	$pv = 0.23847 + 0.035508p + 0.03238p^2 - 0.07141p^3$
-183.0°C	$pv = 0.32992 + 0.06229p + 0.06735p^2$
-150°C	$pv = 0.4507 + 0.0509p + 0.06259p^2$
-100°C	$pv = 0.6336 + 0.0531p + 0.06165p^2$
-50°C	$pv = 0.81655 + 0.0532p + 0.0794p^2$
0°C	$pv = 0.99945 + 0.0529p$
+50°C	$pv = 1.18245 + 0.0524p$
100°C	$pv = 1.3654 + 0.0508p$
200°C	$pv = 1.7312 + 0.0494p$
300°C	$pv = 2.0970 + 0.0468p$
400°C	$pv = 2.46285 + 0.0452p$

He, Helium.—(Continued)
 Leiden Temperature Scale
 $pv = 1.0000$ at 0°C and 1 atm. (109)

p , atm.	pv	p , atm.	pv	p , atm.	pv	p , atm.	pv
-205.31°C		-212.06°C		-217.41°C		-252.65°C	
43.987	0.2690	40.113	0.2421	36.351	0.2202	12.411	0.0748
47.605	0.2707	42.770	0.2433	38.669	0.2213	13.196	0.0749
50.301	0.2721	42.749	0.2432	41.026	0.2224	13.903	0.0750
		45.220	0.2444				

p , atm.	pv
-258.33°C	
8.614	0.0513
9.168	0.0511
9.728	0.0510

Leiden Temperature Scale
 $pv = 1.0000$ at 0°C and 1 atm. (18)

p , atm.	pv	p , atm.	pv
-37.40°C		-70.32°C	
24.46	0.8758	22.82	0.7541
26.87	0.8774	24.89	0.7556
26.88	0.8770	28.77	0.7584
30.24	0.8791	28.78	0.7584
31.35	0.8796	33.92	0.7609
37.43	0.8842	35.29	0.7629
37.44	0.8834	41.13	0.7645
37.55	0.8834	43.39	0.7667
46.55	0.8874	56.27	0.7731

-103.64°C		-142.01°C	
21.34	0.6321	20.54	0.4911
21.54	0.6320	24.58	0.4932
24.12	0.6337	24.88	0.4932
27.66	0.6362	24.88	0.4933
27.69	0.6360	28.20	0.4954
32.40	0.6388	28.76	0.4957
32.62	0.6388	28.77	0.4958
35.31	0.6403	34.06	0.4988
39.52	0.6422	41.52	0.5027
49.96	0.6479	53.06	0.5088

-183.32°C		-201.51°C	
20.61	0.3391	20.10	0.2716
23.21	0.3407	29.69	0.2769
23.22	0.3407		
26.54	0.3426		
30.97	0.3451		
37.02	0.3482		

-225.01°C		-235.91°C	
43.44	0.1952	36.68	0.1498
43.47	0.1951	40.32	0.1515
48.58	0.1976	50.34	0.1562
55.06	0.2008	50.35	0.1561
		55.16	0.1585

-249.87°C		-252.63°C	
25.27	0.0896	22.53	0.0773
26.93	0.0902	23.84	0.0777
26.95	0.0902	25.31	0.0782
28.84	0.0909	26.97	0.0788
31.12	0.0918	28.26	0.0792
32.84	0.0925		

p , atm.	pv	p , atm.	pv
-256.04°C		-258.78°C	
18.74	0.0617	15.43	0.0490
19.61	0.0619	16.01	0.0491
20.63	0.0622	16.65	0.0492
21.70	0.0625	17.30	0.0493
22.50	0.0627	17.78	0.0494

$v = 1.0000$ at 0°C and 1 atm. (97)

p , atm.	pv	p , atm.	pv
-103.57°C		-182.75°C	
20.580	0.6314	13.751	0.3379
24.100	0.6330	16.019	0.3390
29.185	0.6360	18.189	0.3402
33.383	0.6384		

$$pv = 0.6203 + \frac{0.0337}{v} \quad -103.57^\circ$$

$$pv = 0.3306 + \frac{0.03176}{v} \quad -182.75^\circ$$

$v = 1.0000$ at 0°C and 1 atm. (98)

p , atm.	pv	p , atm.	pv
-268.88°C		-269.37°C	
0.2709	0.0145	0.1550	0.0129
0.3551	0.0140	0.1616	0.0129
0.3800	0.0140	0.2493	0.0125
0.6624	0.0127	0.2748	0.0123
0.9928	0.0107	0.2757	0.0123
		0.4322	0.0115
		0.5703	0.0107
-269.69°C		-270.52°C	
0.2323	0.0113	0.0308	0.0091
0.2608	0.0110	0.0486	0.0087
0.3531	0.0104	0.0649	0.0086

Virial Coefficients of Helium

$pv = A + B/v$; Leiden temperature scale; $v = 1.00000$ at 0°C and 1 atm. (1)

T , °K	A	B
69.86	0.25572	+0.000100
20.55	0.07520	-0.000004
20.53	0.07516	-0.000009
20.51	0.07508	-0.000009
18.22	0.06669	-0.000024
16.65	0.06096	-0.000024

p , m Hg	100 α (52, 53)				
	0 to 50°C	0 to 100°C	0 to 200°C	0 to 300°C	0 to 400°C
0	0.3660	0.3660	0.3660	0.3660	0.3660
1*	0.3658	0.3658	0.3658	0.3658	0.3658
10	0.3635	0.3634	0.3633	0.3632	0.3633
20	0.3609	0.3608	0.3606	0.3605	0.3605
30	0.3584	0.3582	0.3579	0.3578	0.3578
40	0.3558	0.3556	0.3552	0.3551	0.3551
50	0.3532	0.3529	0.3526	0.3524	0.3525
60	0.3506	0.3503	0.3501	0.3498	0.3499
70	0.3481	0.3477	0.3475	0.3473	0.3474
80	0.3455	0.3450	0.3450	0.3447	0.3448

* At ca. $p = 1$ m Hg, $100\alpha = 0.36604 - 0.00019p$ (49).

$\frac{1}{v}$	100 β (52, 53)				
	0 to 50°C	0 to 100°C	0 to 200°C	0 to 300°C	0 to 400°C
0	0.3661	0.3661	0.3661	0.3660	0.3660
1*	0.3661	0.3661	0.3660	0.3660	0.3660
10	0.3660	0.3658	0.3656	0.3655	0.3654
20	0.3658	0.3656	0.3652	0.3649	0.3648
30	0.3656	0.3653	0.3648	0.3643	0.3641
40	0.3655	0.3650	0.3645	0.3638	
50	0.3653	0.3648	0.3640		
60	0.3652	0.3645			

* At ca. $p = 1$ m Hg, $100\beta = 0.36604 - 0.00004p$ (49).

Kr, Krypton

$v = 1.000$ at 0°C and 1 atm. (113)

p , atm.	pv	p , atm.	pv
11.2°C		237.3°C	
25.88	1.012	50.93	1.882
27.91	1.008	54.82	1.880
30.31	1.000	59.36	1.874
33.15	0.993	65.12	1.868
36.60	0.980	71.20	1.862
40.89	0.968	79.25	1.859
46.29	0.953	89.53	1.856
49.58	0.940	104.09	1.877
53.72	0.937		
57.81	0.918		
63.07	0.901		
69.46	0.884		
72.10	0.863		
87.39	0.841		
101.74	0.821		

N₂, Nitrogen; v. p. 17

Ne, Neon

p in atm.; $v = 1.0000$ at 0°C and 1 atm.; range, 0 to 95 atm. (53, 54, 147)

-207.9°C	$pv = 0.23885 - 0.021231p + 0.05177p^2 + 0.09894p^3$
-182.5°C	$pv = 0.3318 - 0.03365p + 0.05225p^2$
-150°C	$pv = 0.45075 + 0.054p + 0.05136p^2$
-100°C	$pv = 0.6337 + 0.03288p + 0.0550p^2$
-50°C	$pv = 0.8166 + 0.03407p + 0.0635p^2$
0°C	$pv = 0.9995 + 0.03530p$
$+100^\circ\text{C}$	$pv = 1.3653 + 0.03584p$
200°C	$pv = 1.7312 + 0.03609p$
300°C	$pv = 2.0970 + 0.03631p$
400°C	$pv = 2.4629 + 0.03607p$

Leiden Temperature Scale

$v = 1.0000$ at 0°C and 1 atm. (28, 101)

p , atm.	pv	p , atm.	pv
$+20.00^\circ\text{C}$		0.00°C	
22.804	1.0835	22.064	1.0089
25.015	1.0852	23.555	1.0103
26.575	1.0863	25.867	1.0121
29.090	1.0872	28.468	1.0135
32.572	1.0897	30.790	1.0147
34.887	1.0902	39.753	1.0168
35.423	1.0917	44.892	1.0196
37.812	1.0928	59.777	1.0265
39.168	1.0928	66.104	1.0307
44.762	1.0955	74.059	1.0359
54.149	1.1003	79.108	1.0392
59.717	1.1026	84.662	1.0408
65.021	1.1059		
77.360	1.1131		
82.545	1.1160		
88.239	1.1186		
93.298	1.1220		
-103.01°C		-141.22°C	
35.558	0.6304	33.840	0.4846
36.697	0.6302	37.707	0.4852
40.610	0.6324	38.581	0.4853
42.107	0.6329	43.319	0.4869
55.136	0.6369	49.881	0.4875
58.583	0.6384	51.916	0.4878
78.110	0.6481	66.471	0.4927
		78.558	0.4970
-182.60°C		-200.08°C	
32.067	0.3210	26.214	0.2494
32.988	0.3208	28.402	0.2483
36.438	0.3205	31.417	0.2469
36.880	0.3205	34.268	0.2451
41.371	0.3196	34.285	0.2451
42.533	0.3194	39.843	0.2425
49.943	0.3189	39.891	0.2423
p , atm.	pv	p , atm.	pv
-217.52°C			
21.349	0.1730		
22.997	0.1707		
24.686	0.1683		
26.848	0.1652		
30.042	0.1607		
32.795	0.1564		
49.930	0.1393		
53.528	0.1353		
59.618	0.1301		
64.975	0.1269		
71.649	0.1253		
79.417	0.1256		

O₂, Oxygen

p , atm.	pv (3)				p , atm.	pv (3)	
	0°C	15.65°C	99.50°C	199.50°C		0°C	15.6°C
1	1.0000				1	1.0000	
100	0.9265	1.0045	1.3750		500	1.1570	
200	0.9140	0.9945	1.4000	1.8190	1000	1.7360	1.8000
300	0.9625	1.0420	1.4530	1.8850	1200	1.9620	2.0268
400	1.0515	1.1250	1.5320	1.9610	1400	2.1798	2.2470
500	1.1560	1.2270	1.6220	2.0500	1600	2.3960	2.4640
600	1.2690	1.3370	1.7200	2.1420	1800	2.6073	2.6793
700	1.3855	1.4515	1.8270	2.2415	2000	2.8160	2.8880
800	1.5030	1.5660	1.9340	2.3430	2200	3.0217	3.0932
900	1.6200	1.6820	2.0415	2.4465	2400	3.2244	3.2976
1000	1.7355	1.7980	2.1510		2600	3.4229	3.4996
					2800	3.6176	3.6946
					3000		3.8880

p in atm.; $v = 1.0000$ at 0°C and 1 atm.; range, 0 to 100 atm. (52, 67)

0°C	$pv = 1.0010 - 0.03994p + 0.05219p^2$
20°C	$pv = 1.07425 - 0.03753p + 0.05150p^2$
50°C	$pv = 1.1842 - 0.03491p + 0.05170p^2$
100°C	$pv = 1.3674 - 0.03160p + 0.05137p^2$
0°C	$pv = 1.0010 - \frac{0.03958}{v} + \frac{0.05206}{v^2}$
20°C	$pv = 1.07425 - \frac{0.03804}{v} + \frac{0.05206}{v^2}$

Leiden Temperature Scale

$pv = 1.0000$ at 0°C and 1 atm. (96)

p , atm.	pv	p , atm.	pv
-40.01°C		-80.00°C	
5.755	0.8462	6.445	0.6926
7.385	0.8432	7.300	0.6902
8.559	0.8416	7.918	0.6892
9.382	0.8403		
-102.49°C		-109.99°C	
4.759	0.6105	5.594	0.5788
5.783	0.6076	6.218	0.5767
6.507	0.6051	6.684	0.5745
7.029	0.6037		
-113.94°C		-116.01°C	
5.470	0.5642	4.506	0.5594
6.092	0.5613	5.422	0.5557
6.501	0.5597	6.008	0.5534
		6.486	0.5512
p , atm.	pv	p , atm.	pv
-152.56°C			
	3.251		0.4213
	4.636		0.4117
	4.854		0.4102

$v = 1.0000$ at 0°C and 1 atm. (137); Leiden temperature scale

p , atm.	pv	p , atm.	pv	p , atm.	pv
0°C		15.6°C		20°C	
36.20	0.9685	34.10	1.0322	35.61	1.0499
38.77	0.9661	44.19	1.0252	40.49	1.0467
46.90	0.9590	56.70	1.0168	46.10	1.0427
47.15	0.9589			51.38	1.0392
54.74	0.9528			57.04	1.0358
				62.43	1.0329

Leiden Temperature Scale
 $v = 1.0000$ at 0°C and 1 atm. (104)

p , atm.	pv	p , atm.	pv
-40.05°C		-80.03°C	
21.142	0.8218	21.010	0.6550
28.034	0.8112	27.295	0.6388
34.794	0.7992	33.475	0.6221
41.818	0.7898	34.178	0.6213
49.255	0.7806	39.240	0.6086
55.425	0.7713	43.247	0.5976
61.030	0.7642	44.613	0.5949
		50.430	0.5772
		61.880	0.5464
-102.46°C		-109.97°C	
20.118	0.5594	20.010	0.5244
26.932	0.5344	25.330	0.5022
31.601	0.5155	29.977	0.4804
37.564	0.4910	35.427	0.4544
42.513	0.4710	38.979	0.4346
48.720	0.4420	45.687	0.3989
54.588	0.4127	51.130	0.3618
60.474	0.3811	56.200	0.3220
		56.655	0.3174
		60.867	0.2770
-113.97°C		-116.01°C	
20.149	0.5044	22.300	0.4835
24.462	0.4847	27.849	0.4560
28.893	0.4624	32.648	0.4297
33.731	0.4370	37.468	0.4012

p , atm.	pv	p , atm.	pv
-113.97°C		-116.01°C	
33.758	0.4369	43.947	0.3541
37.979	0.4133	50.445	0.2836
43.890	0.3739	50.506	0.2816
48.304	0.3385	52.446	0.2477
51.059	0.3061	53.469	0.2213
52.543	0.2951	54.200	0.1959
54.066	0.2672	54.319	0.1638
56.761	0.2073	54.635	0.1792
58.518	0.1754	55.050	0.1667
p , atm.		pv	
-116.99°C			
20.264		0.4891	
22.298		0.4783	
26.413		0.4579	
30.248		0.4371	
34.117		0.4144	
37.210		0.3958	
43.662		0.3458	
48.344		0.2936	
49.507		0.2790	
51.297		0.2388	
52.072		0.1745	
52.218		0.1671	
52.343		0.1989	
52.649		0.1776	
53.000		0.1587	

p_0 , atm.	100 α (3)			100 β (3)	
	0 to 15.6°C	0 to 99.5°C	99.5 to 199.5°C	0 to 15.6°C	0 to 99.5°C
100	0.538	0.486		0.480	0.492
200	0.561	0.534	0.300	0.570	0.613
300	0.528	0.512	0.297	0.641	0.696
400	0.450	0.459	0.280	0.691	0.731
500	0.388	0.405	0.264	0.697	0.740
600	0.341	0.357	0.245	0.737	
700	0.301	0.320	0.226		
800	0.270	0.288	0.212	0.705	
900	0.248	0.261	0.198		
1000	0.233	0.241		0.679	
1200	0.212			0.668	
1500	0.190			0.657	
1800	0.174				
2000	0.165			0.602	
2400	0.148			0.580	
2500	0.145				
2800	0.137			0.538	
3000	0.134				

p , m Hg	100 α (52)		$\frac{1}{v}$	100 β (52)	
	0 to 50°C	0 to 100°C		0 to 50°C	0 to 100°C
0	0.3660	0.3660	0	0.3660	0.3660
1	0.3679	0.3676	1	0.3677	0.3676
5	0.3752	0.3739	5	0.3739	0.3734
10	0.3842	0.3817	10	0.3817	0.3809
15	0.3932	0.3894	15	0.3894	0.3882
20	0.4019	0.3971	20	0.3970	0.3956
25	0.4107	0.4047	25	0.4044	0.4028
30	0.4193	0.4123	30	0.4117	0.4101

p , m Hg	100 α (52)		$\frac{1}{v}$	100 β (52)	
	0 to 50°C	0 to 100°C		0 to 50°C	0 to 100°C
35	0.4279	0.4199	35	0.4190	0.4174
40	0.4364	0.4274	40	0.4262	0.4247
45	0.4446	0.4347	45	0.4337	0.4322
50	0.4530	0.4420	50	0.4411	0.4396
55	0.4614	0.4492	55	0.4488	0.4472
60	0.4696	0.4563	60	0.4565	
65	0.4777	0.4632	65	0.4642	
70	0.4856	0.4701			
75	0.4935	0.4768			

p , respectively $p_0 = 1\text{ atm.}$ (70)

100 α		100 β	
0°C	0 to 100°C	0°C	0 to 100°C
0.3675	0.3672	0.3672	0.3671

Xe, Xenon

$v = 1.000$ at 0°C and 1 atm. (113)

p , atm.	pv	p , atm.	pv	p , atm.	pv
11.2°C			237.3°C		
25.65	0.697	36.39	0.628	53.53	1.397
26.62	0.691	38.42	0.612	57.97	1.389
27.68	0.685	40.69	0.598	63.21	1.377
28.79	0.677	43.24	0.576	69.62	1.375
30.07	0.670	46.22	0.552	77.54	1.359
31.40	0.659	49.39	0.522	88.15	1.354
32.92	0.650	53.20	0.437	102.55	1.357
34.57	0.640				

Air

p , atm.	pv (3)			
	0°C	15.70°C	99.40°C	200.4°C
1	1.0000			
100	0.9730	1.0389	1.4030	
150	0.9840	1.0555	1.4310	1.8430
200	1.0100	1.0855	1.4670	1.8860
250	1.0490	1.1260	1.5110	1.9340
300	1.0975	1.1740	1.5585	1.9865
350	1.1540	1.2250	1.6085	2.0410
400	1.2145	1.2835	1.6625	2.0960
450	1.2765	1.3460	1.7200	2.1530
500	1.3400	1.4110	1.7815	2.2110
550	1.4040	1.4740	1.8440	2.2700
600	1.4700	1.5375	1.9060	2.3300
650	1.5365	1.6015	1.9670	2.3900
700	1.6020	1.6670	2.0300	2.4515
750	1.6690	1.7340	2.0930	2.5130
800	1.7345	1.8000	2.1555	2.5750
850	1.7990	1.8655	2.2180	2.6370
900	1.8640	1.9300	2.2830	2.7000
950	1.9280	1.9960	2.3490	2.7640
1000	1.9920	2.0600	2.4150	2.8280

p , atm.	pv (3)		
	0°C	15.7°C	45.10°C
1	1.0000		
500	1.3400		
1000	1.9990	2.0615	2.1765
1100	2.1329	2.1912	2.3067
1200	2.2596	2.3196	2.4360
1300	2.3842	2.4440	2.5610
1400	2.5081	2.5676	2.6838

Air.—(Continued)			
<i>p</i> , atm.	<i>p</i> <i>v</i> (3)		
	0°C	15.7°C	45.10°C
1500	2.6310	2.6902	2.8072
1600	2.7528	2.8112	2.9320
1700	2.8738	2.9325	3.0540
1800	2.9916	3.0510	3.1725
1900	3.1103	3.1692	3.2927
2000	3.2260	3.2860	3.4100
2100	3.3400	3.4209	3.5248
2200	3.4540	3.5156	3.6388
2300	3.5661	3.6294	3.7547
2400	3.6804	3.7428	3.8688
2500	3.7912	3.8550	3.9837
2600	3.9000	3.9650	4.0963
2700	4.0081	4.0770	4.2052
2800	4.1146	4.1860	4.3148
2900	4.2195	4.2934	4.4225
3000	4.3230	4.3980	4.5285

p in atm.; *p**v* = 1.0000 at 0°C and 1 atm.; range, 0 to 100 atm. (53)

0°C	$p v = 1.0006 - 0.0_3 603 p + 0.0_5 302 p^2$
50°C	$p v = 1.1838 - 0.0_3 141 p + 0.0_5 217 p^2$
100°C	$p v = 1.3668 + 0.0_3 159 p + 0.0_5 179 p^2$
150°C	$p v = 1.5500 + 0.0_3 380 p + 0.0_5 135 p^2$
200°C	$p v = 1.7328 + 0.0_3 550 p + 0.0_5 105 p^2$

Leiden Temperature Scale

*p**v* = 1.0000 at 0°C and 1 atm. (108)

p , atm.	pv	p , atm.	pv
20.00°C		-70.09°C	
28.548	1.0654	52.810	0.6611
34.103	1.0637	58.860	0.6533
42.747	1.0613		
57.300	1.0598		
61.426	1.0595		
-84.08°C		-103.48°C	
48.031	0.5979	40.760	0.5099
52.753	0.5890	43.411	0.5024
56.250	0.5830	45.017	0.4979
		48.400	0.4882

p atm.	pv	p , atm.	p
-122.03°C		-129.97°C	
34.122	0.4232	30.961	0.3864
36.736	0.4112	33.458	0.3717
39.458	0.3985	35.729	0.3580
-135.00°C		140.00°C	
28.877	0.3627	27.055	0.3374
31.113	0.3476	30.174	0.3106
33.009	0.3337		
p , atm.		pv	
-145.05°C			
25.033		0.3126	
26.721		0.2947	
27.876		0.2805	

<i>p</i> , atm.	100α (3)			100β (3)	
	0 to 15.7°C	0 to 99.4°C	99.4 to 200.4°C	0 to 15.7°C	0 to 99.4°C
100		0.444		0.446	0.462
200	0.475	0.455	0.287	0.541	0.552
300	0.436	0.422	0.275	0.616	0.600
400	0.370	0.371	0.261	0.621	0.617
500	0.327	0.331	0.241	0.637	0.617
600	0.294	0.294	0.222	0.616	
700	0.265	0.269	0.207		
800	0.241	0.244	0.194	0.605	
900	0.223	0.226	0.182		
1000	0.206	0.214	0.171	0.567	
1200	0.177			0.504	
1500	0.144			0.467	
1800	0.124			0.439	
2000	0.116			0.417	
2400	0.108			0.403	
2500	0.107				
2800	0.110				
3000	0.110				

<i>p</i> , m Hg	100α (53, 55)			
	0 to 50°C	0 to 100°C	0 to 150°C	0 to 200°C
1	0.3676	0.3674	0.3673	0.3672
10	0.3803	0.3785	0.3769	0.3760
20	0.3943	0.3904	0.3876	0.3855
30	0.4078	0.4019	0.3978	0.3947
40	0.4203	0.4126	0.4072	0.4031
50	0.4315	0.4224	0.4156	0.4106
60	0.4412	0.4309	0.4230	0.4172
70	0.4502	0.4385	0.4295	0.4230
75	0.4543	0.4418	0.4325	0.4255

$\frac{1}{v}$	100β (53, 55)			
	0 to 50°C	0 to 100°C	0 to 150°C	0 to 200°C
1	0.3675	0.3675	0.3674	0.3674
10	0.3798	0.3794	0.3790	0.3788
20	0.3940	0.3932	0.3925	0.3919
30	0.4080	0.4067	0.4056	0.4048
40	0.4216	0.4201	0.4186	0.4178
50	0.4351	0.4337	0.4322	
60	0.4486			
65	0.4557			

<i>p</i> , atm.	100α, constant pressure (141)								
	0 to 100°C	0 to 16°C	0 to −35°C	0 to −78.5°C	0 to −103.5°C	0 to −130°C	0 to −135°C	0 to −140°C	0 to −145°C
10	0.375	0.376							
20	0.383	0.387		0.401	0.410	0.427		0.440	0.450
30	0.392	0.398		0.420	0.434	0.462	0.477	0.492	0.519*
40	0.402	0.408		0.438	0.461	0.508	0.544	0.632	
50	0.410	0.419	0.430	0.457	0.487	0.569	0.619		
60	0.418	0.429	0.442	0.476	0.512	0.610	0.622		
70	0.425	0.438	0.454	0.494	0.536	0.612			
80	0.431	0.446	0.467	0.512	0.557	0.607			
90	0.437	0.452	0.479	0.527	0.572				
100	0.441	0.458	0.489	0.537	0.579				
110	0.445	0.462	0.497	0.545	0.580				
120	0.449	0.465	0.501	0.550	0.577				
130		0.468		0.551	0.571				

* *p* = 29 atm.

B-Table, Chemical Compounds

Standard arrangement

NH₃, Ammonia (63)

$v = 39 \text{ cm}^3/\text{g}$		$v = 44 \text{ cm}^3/\text{g}$		$v = 49 \text{ cm}^3/\text{g}$		$v = 54 \text{ cm}^3/\text{g}$		$v = 59 \text{ cm}^3/\text{g}$	
$t, ^\circ\text{C}$	$p, \text{atm.}$	$t, ^\circ\text{C}$	$p, \text{atm.}$	$t, ^\circ\text{C}$	$p, \text{atm.}$	$t, ^\circ\text{C}$	$p, \text{atm.}$	$t, ^\circ\text{C}$	$p, \text{atm.}$
75.14	32.522	69.65	28.992	62.00	25.709	61.96	23.891	55.70	21.597
75.21	32.509	75.86	29.951	69.68	26.750	69.69	24.825	60.31	22.105
80.16	33.371	79.86	30.547	75.81	27.532	75.24	25.475	65.98	23.075
84.73	34.153	89.42	31.863	79.77	28.059	79.69	25.955	73.57	23.553
89.51	34.925	94.03	32.522	84.81	28.689	84.66	26.536	73.83	23.576
93.81	35.628	100.32	33.416	89.37	29.262	84.60	26.511	79.16	24.114
100.32	36.703	104.94	34.057	94.09	29.858	89.35	27.058	79.71	24.172
105.66	37.584	110.81	34.864	100.37	30.638	94.06	27.574	83.22	24.537
110.78	38.397	115.88	35.532	105.02	31.201	100.38	28.274	88.06	25.022
115.95	39.234	121.29	36.261	111.18	31.953	104.88	28.757	92.82	25.514
121.25	40.047	127.01	37.011	115.91	32.508	111.05	29.422	97.61	25.992
				121.14	33.142	115.94	29.938	103.46	26.561
				126.66	33.788	121.21	30.507	109.25	27.125
				131.91	34.384	126.55	31.070	115.10	27.699
						132.00	31.632	119.34	28.084
								123.92	28.526
								128.81	29.016
								134.89	29.549
								140.47	30.079
								146.23	30.629
								152.47	31.203
								158.70	31.780
								164.31	32.292

 v is expressed in cm^3/g (75)

$t, ^\circ\text{C}$	v	1300	500	300	200	150	115	85.5
$p \text{ (kg/cm}^2\text{)}$								
-35	0.8935							
-30	0.9110							
-20	0.9512							
-10		2.5017						
0	1.0305	2.6116						
+ 5			4.3267					
10			4.4212					
15				6.573				
25	1.1288	2.8788	4.7000	6.866	8.905			
30					9.105	11.499		
35						11.770		

$t, ^\circ\text{C}$	v	1300	500	300	200	150	115	85.5
$p \text{ (kg/cm}^2\text{)}$								
50	1.2263	3.1403	5.1504	7.571	9.885	12.566	16.245	
100	1.4199	3.6549	6.0256	8.919	11.730	15.051	19.745	
150	1.6128	4.1639	6.8854	10.231	13.510	17.419	23.026	
200	1.8050	4.6695	7.7376	11.524	15.257	19.733	26.204	
250		5.1735	8.5847	12.807	16.986	22.014	29.322	
300			9.4291	14.084	18.703	24.278		

 p , respectively $p_0 = 1 \text{ atm.}$ (70)

100 α				100 β			
0 $^\circ\text{C}$		0 to 100 $^\circ\text{C}$		0 $^\circ\text{C}$		0 to 100 $^\circ\text{C}$	
0.386		0.380		0.380		0.377	

CO₂, Carbon dioxide

$p, \text{atm.}$	Values of pv (3)									
	0 $^\circ\text{C}$	10 $^\circ\text{C}$	20 $^\circ\text{C}$	30 $^\circ\text{C}$	40 $^\circ\text{C}$	50 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$	90 $^\circ\text{C}$
1	1.0000									
50	0.1050	0.1145	0.6800	0.7750	0.8500	0.9200	0.9840	1.0430	1.0960	1.1530
75	0.1530	0.1630	0.1800	0.2190	0.6200	0.7470	0.8410	0.9180	0.9880	1.0515
100	0.2020	0.2130	0.2285	0.2550	0.3090	0.4910	0.6610	0.7770	0.8725	0.9535
125	0.2490	0.2620	0.2785	0.3000	0.3350	0.3950	0.5100	0.6430	0.7590	0.8580
150	0.2950	0.3090	0.3260	0.3460	0.3770	0.4190	0.4850	0.5750	0.6805	0.7815
175	0.3405	0.3550	0.3725	0.3930	0.4215	0.4570	0.5055	0.5730	0.6515	0.7410
200	0.3850	0.4010	0.4190	0.4400	0.4675	0.5000	0.5425	0.5955	0.6600	0.7315
225	0.4305	0.4455	0.4655	0.4875	0.5130	0.5425	0.5825	0.6285	0.6815	0.7460
250	0.4740	0.4900	0.5100	0.5335	0.5580	0.5865	0.6250	0.6670	0.7135	0.7690
275	0.5170	0.5340	0.5545	0.5775	0.6040	0.6330	0.6675	0.7070	0.7515	0.8015
300	0.5595	0.5775	0.5985	0.6225	0.6485	0.6765	0.7100	0.7485	0.7900	0.8375
350	0.6445	0.6640	0.6850	0.7090	0.7365	0.7650	0.7980	0.8325	0.8725	0.9135
400	0.7280	0.7475	0.7710	0.7950	0.8230	0.8515	0.8840	0.9180	0.9560	0.9660
450	0.8090	0.8310	0.8550	0.8800	0.9075	0.9365	0.9690	1.0035	1.0400	1.0775
500	0.8905	0.9130	0.9380	0.9630	0.9900	1.0210	1.0540	1.0880	1.1240	1.1610
550	0.9700	0.9935	1.0200	1.0465	1.0740	1.1035	1.1370	1.1720	1.2085	1.2430

INTERNATIONAL CRITICAL TABLES

CO₂, Carbon dioxide.—(Continued)

p , atm.	Values of pv (3)									
	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°C
600	1.0495	1.0730	1.0995	1.1275	1.1570	1.1865	1.2190	1.2540	1.2900	1.3265
650	1.1275	1.1530	1.1800	1.2075	1.2375	1.2680	1.3010	1.3360	1.3725	1.4085
700	1.2055	1.2320	1.2590	1.2890	1.3190	1.3500	1.3825	1.4170	1.4535	1.4900
750	1.2815	1.3105	1.3395	1.3700	1.4000	1.4315	1.4640	1.4985	1.5335	1.5705
800	1.3580	1.3870	1.4170	1.4475	1.4790	1.5105	1.5435	1.5780	1.6140	1.6505
850	1.4340	1.4625	1.4935	1.5245	1.5570	1.5885	1.6225	1.6575	1.6925	1.7285
900	1.5090	1.5385	1.5685	1.6000	1.6325	1.6650	1.6995	1.7345	1.7710	1.8075
950	1.5830	1.6115	1.6430	1.6740	1.7065	1.7395	1.7745	1.8100	1.8470	1.8845
1000	1.6560	1.6850	1.7160	1.7480	1.7800	1.8140	1.8475	1.8840	1.9210	1.9590

p , atm.	100°C	137°C	198°C	258°C	p , atm.	100°C	137°C	198°C	258°C
50	1.2065	1.3800			450	1.1190	1.2880	1.6160	1.9280
75	1.1180	1.3185	1.6150	1.8670	500	1.2005	1.3620	1.6775	
100	1.0300	1.2590	1.5820	1.8470	550	1.2830	1.4400	1.7450	
125	0.9470	1.2050	1.5530	1.8310	600	1.3655	1.5180	1.8120	
150	0.8780	1.1585	1.5295	1.8180	650	1.4475	1.5960	1.8835	
175	0.8320	1.1230	1.5100	1.8095	700	1.5285	1.6760	1.9560	
200	0.8145	1.0960	1.4960	1.8040	750	1.6100	1.7565	2.0330	
225	0.8175	1.0835	1.4890	1.8035	800	1.6890	1.8355	2.1080	
250	0.8355	1.0810	1.4870	1.8060	850	1.7680	1.9150	2.1860	
275	0.8600	1.0885	1.4875	1.8115	900	1.8460	1.9940	2.2600	
300	0.8900	1.1080	1.4935	1.8200	950	1.9230	2.0720	2.3350	
350	0.9615	1.1565	1.5210	1.8465	1000	1.9990			
400	1.0385	1.2175	1.5630	1.8830					

COMPRESSIBILITY IN THE NEIGHBORHOOD OF SATURATION
 p in atm.; $v = 1.0000$ at 0°C and 1 atm. (62)

v	p , atm.	pv	v	p , atm.	pv
25.55°C					
0.008573	63.12	0.5411	0.007807	66.75	0.5212
0.007812	64.36	0.5028	0.007030	67.99	0.4780
28.15°C					
0.009338	63.44	0.5924	0.006950	68.19	0.4739
0.008565	65.19	0.5583	0.006673	68.39	0.4564

BORDER CURVE IN THE NEIGHBORHOOD OF THE CRITICAL
 POINT (62)

Beginning condensation			End condensation		
t , °C	v	p , atm.	t , °C	v	p , atm.
30.05	0.005594	71.47	30.11	0.003328	71.53
30.82	0.004833	72.725	30.81	0.003725	72.74

Critical temperature = 30.98°C; critical pressure = 72.93 atm.;
 critical volume = 0.00443; $v = 1.0000$ at 0°C and 1 atm. (62)

v	p , atm.	pv	v	p , atm.	pv
Critical isothermal (30.98°C)					
0.010068	63.36	0.6379	0.003959	72.96	0.2888
0.009314	65.39	0.6090	0.003656	72.995	0.2669
0.008582	67.22	0.5769	0.003296	73.53	0.2423
0.007809	69.085	0.5395	0.003230	73.89	0.2387
0.007031	70.73	0.4973	0.003051	75.43	0.2302
0.006275	71.95	0.4515	0.002862	79.43	0.2273
0.005483	72.745	0.3988	0.002721	86.10	0.2343
0.005102	72.87	0.3718	0.002593	95.70	0.2482
0.004777	72.93	0.3484	0.002509	106.18	0.2664
0.004403	72.94	0.3211	0.002435	119.35	0.2906
0.004254	72.98	0.3104	0.002362	138.65	0.3275

v	p , atm.	pv	v	p , atm.	pv
31.89°C					
0.010086	63.87	0.6442	0.010067	65.18	0.6562
0.009314	65.995	0.6147	0.009337	67.295	0.6283
0.008570	67.945	0.5823	0.008560	69.49	0.5948
0.007771	70.03	0.5442	0.007791	71.64	0.5581
0.007017	71.68	0.5030	0.007023	73.65	0.5173
0.006267	73.035	0.4577	0.006255	75.34	0.4712
0.005528	73.94	0.4087	0.005529	76.605	0.4236
0.005117	74.24	0.3799	0.004672	77.575	0.3624
0.004742	74.44	0.3530	0.003971	78.385	0.3113
0.004364	74.56	0.3254	0.003243	81.11	0.2630
0.003942	74.69	0.2944	0.002955	86.16	0.2546
0.003610	75.00	0.2707	0.002746	95.02	0.2609
0.003228	76.20	0.2460	0.002614	105.95	0.2770
0.002883	82.02	0.2365	0.002510	119.53	0.3000
0.002717	89.90	0.2443	0.002426	136.66	0.3316
0.002593	99.77	0.2587			
0.002503	111.45	0.2790			
0.002439	122.79	0.2995			
0.002377	136.71	0.3249			
37.09°C					
0.010863	64.56	0.7013	0.011546	64.85	0.7487
0.010093	66.90	0.6752	0.0107945	67.28	0.7262
0.009339	69.20	0.6471	0.010047	69.81	0.7014
0.008554	71.73	0.6135	0.009211	72.78	0.6704
0.007810	74.11	0.5788	0.008486	75.48	0.6405
0.007059	76.40	0.5394	0.007640	78.57	0.6003
0.006287	78.585	0.4940	0.006915	81.31	0.5622
0.005525	80.47	0.4446	0.006181	84.04	0.5194
0.004770	82.11	0.3917	0.005320	87.18	0.4638
0.004011	83.89	0.3365	0.004530	90.13	0.4082
0.003230	88.89	0.2871	0.003778	94.10	0.3555
0.002799	103.08	0.2885	0.003087	105.01	0.3242
0.002609	119.27	0.3112	0.002817	117.96	0.3323
0.002495	136.01	0.3393	0.002642	134.85	0.3563

v	p , atm.	pv	v	p , atm.	pv
48.10°C			57.75°C		
0.012311	65.20	0.8027	0.013174	66.27	0.8730
0.011572	67.69	0.7833	0.012356	69.20	0.8550
0.010787 ₅	70.52	0.7607	0.011586	72.18	0.8363
0.009970	73.61	0.7339	0.010807	75.42	0.8151
0.009232	76.61	0.7073	0.010009	78.99	0.7906
0.008442	80.07	0.6760	0.009271	82.49	0.7648
0.007678	83.38	0.6402	0.008482	86.62	0.7347
0.006899	87.07	0.6007	0.007668	91.16	0.6990
0.006118	90.90	0.5561	0.006930	95.79	0.6638
0.005380	94.78	0.5099	0.006113	101.32	0.6194
0.004570	99.62	0.4552	0.005372	107.06	0.5751
0.003823	105.50	0.4033	0.004596	114.45	0.5260
0.003129 ₅	119.38	0.3736	0.003795	126.10	0.4786
0.002864	135.56	0.3883	0.003421	135.81	0.4647

p , m Hg	100 α (25)			100 β (25)		
	0 to 20°C	0 to 40°C	0 to 100°C	0 to 20°C	0 to 40°C	0 to 100°C
0.518	0.3713	0.3710	0.3707			
0.998	0.3760	0.3754	0.3741	0.3734	0.3730	0.3726
1.377	0.3797	0.3791	0.3770			
p , respectively $p_0 = 1$ atm. (70)						
100 α			100 β			
0°C		0 to 100°C	0°C		0 to 100°C	
0.3750		0.3722	0.3723		0.3711	

VALUES OF pv
 $v = 1.0000$ at 0°C and 1 atm. (62)

$\frac{1}{v}$	25.55°C	28.15°C	30.98°C	31.89°C	34.02°C	37.09°C	41.95°C	48.10°C	57.75°C
80									0.8583
100			0.6355	0.6411	0.6538	0.6719	0.6997	0.7349	0.7903
120		0.5467	0.5653	0.5715	0.5844	0.6036	0.6335	0.6712	0.7285
140		0.4839	0.5037	0.5094	0.5240	0.5440	0.5746	0.6135	0.6743
160			0.4499	0.4566	0.4708	0.4918	0.5237	0.5640	0.6273
180			0.4039	0.4106	0.4254	0.4466	0.4796	0.5212	0.5864
200			0.3646	0.3716	0.3863	0.4081	0.4416	0.4847	0.5521
220			0.3314	0.3387	0.3494	0.3754	0.4094	0.4536	0.5226
240			0.3041	0.3109	0.3226	0.3477	0.3819	0.4264	0.4991
260			0.2806	0.2875	0.3021	0.3243	0.3597	0.4048	0.4812
280			0.2611	0.2680	0.2825	0.3052	0.3423	0.3872	0.4692
300			0.2448	0.2521	0.2677	0.2915	0.3302	0.3763	
320			0.2333	0.2410	0.2590	0.2835	0.3245	0.3737	
340		0.2058	0.2273	0.2321	0.2554	0.2863	0.3255	0.3817	
360	0.1806	0.2043	0.2305	0.2401	0.2588	0.2900	0.3362		
380	0.1886	0.2140	0.2427	0.2530	0.2742	0.3073			
400	0.2084	0.2379	0.2690	0.2800	0.3031	0.3376			
420	0.2442	0.2780	0.3199	0.3230					
440	0.3118								

Values of $\left(\frac{10^5(v_{t_2} - v_{t_1})}{v_{t_1}(t_2 - t_1)}\right)$ at various pressures (3)

p , atm.	0 to 10°C	10 to 20°C	20 to 30°C	30 to 40°C	40 to 50°C	50 to 60°C	60 to 70°C	70 to 80°C	80 to 90°C	90 to 100°C	100 to 137°C	137 to 198°C	198 to 258°C
50	905		1394	1097	823	695	600	508	520	464			
60	800	1259		1557	1081	853	705	604	560	521			
75	654	1043	2166	18310	2048	1258	916	762	643	595	485	369	260
85	637	872	1425	9079	4965	1813	1222	921	753	696			
100	544	728	1159	2128	5899	3462	1755	1229	928	802	601	420	279
125	522	630	772	1666	1791	2911	2608	1804	1304	1037			
150	474	550	613	922	1114	1575	1855	1835	1484	1247	864	525	313
175	423	493	550	728	842	1061	1335	1370	1374	1228	945	565	330
200	416	449	501	625	695	850	977	1083	1083	1134	934	798	343
250	337	408	461	459	511	656	672	697	778	865	794	616	358
300	322	364	401	418	432	495	542	554	601	627	662	570	364
400	268	314	311	352	346	382	384	414	419	426	466	465	341
500	253	274	266	280	313	323	322	330	329	349	364	386	
600	224	247	255	261	255	274	287	287	283	293	302	317	
800	214	216	215	218	223	219	224	228	226	233	234	243	
1000	175	184	180	183	191	184	198	197	198	204	234		

NO, Nitric oxide

p , atm.	pv (21)				
	+9.0°C	-20°C	-40°C	-60°C	-78.6°C
1	1.000	1.000	1.000	1.000	1.000
30	0.9625	0.9475	0.9365	0.9215	0.893
40	0.950	0.931	0.9135	0.891	0.779
50	0.938	0.9135	0.8895	0.8595	0.779
60	0.926	0.897	0.8645	0.8245	0.7095
70	0.9135	0.8805	0.8385	0.785	0.642
80	0.9025	0.8635	0.8125	0.7645	0.5735
90	0.892	0.8455	0.789	0.7075	0.520
100	0.8815	0.8495	0.768	0.662	0.4755
110	0.862	0.8135	0.7475	0.617	0.441
120	0.862	0.800	0.727	0.576	0.419
130	0.8545	0.787	0.711	0.545	0.424
140	0.8545	0.776	0.692	0.528	0.4335
150	0.843	0.767	0.6745	0.518	0.4435
160	0.8375	0.758	0.659	0.524	0.4525

CH₄, Methane (64)*

v , cm ³ /g	p , atm.	pv	p , atm.	pv	p , atm.	pv
0°C			50°C		100°C	
	1.00	1.0000				
35.104	36.37	0.9156	44.55	1.1216	52.63	1.3250
30.089	41.89	0.9040	51.55	1.1124	61.17	1.3200
25.074	49.21	0.8849	61.20	1.1005	72.96	1.3120
20.059	59.85	0.8610	75.35	1.0840	90.56	1.3028
15.045	76.47	0.8251	98.34	1.0611	119.88	1.2935
10.030	107.25	0.7715	143.66	1.0334	179.61	1.2920
9.026	117.08	0.7579	159.21	1.0306	200.51	1.2980
8.024	129.73	0.7465	179.03	1.0303	227.58	1.3096
150°C			200°C			
35.104	60.70	1.5282	68.66	1.7286		
30.089	70.68	1.5252	80.09	1.7283		
25.074	84.64	1.5220	96.22	1.7303		
20.059	105.63	1.5196	120.42	1.7324		
15.045	140.95	1.5208	161.76	1.7454		
10.030	214.59	1.5436	250.03	1.7985		
9.026	240.62	1.5576	280.55	1.8161		
8.024	275.10	1.5831	321.92	1.8525		

* See (155) for revision of this table.

p , m Hg	t	100 α	100 β	Lit.
0.760	0 to 100°C	0.3683	0.3680	(64)
p , respectively $p_0 = 1$ atm. (70)				
100 α		100 β		
0°C	0 to 100°C	0°C	0 to 100°C	
0.369	0.3680	0.368	0.3677	

CH₃Cl, Methyl chloride $v = 1.0000$ at 0°C and 1 atm. (56, 65)

p , atm.	pv	p , atm.	pv
69.9°C		84.95°C	
15.065	1.0251	16.19	1.0909
15.425	1.0190	16.586	1.0834
15.76	1.0115	17.09	1.0734
16.10	1.0062	17.61	1.0665
16.44	0.9966	18.13	1.0561
		18.74	1.0477
		19.36	1.0368
		19.40	1.0367
		20.00	1.0239
		20.68	1.0106
		21.49	0.9969
		22.24	0.9813
99.95°C		115.0°C	
17.67	1.1519	18.26	1.2231
18.26	1.1438	20.12	1.2000
19.02	1.1338	21.57	1.1805
19.86	1.1210	22.99	1.1627
20.76	1.1108	28.99	1.0785
21.82	1.0902	33.53	0.9499
23.15	1.0698	38.30	0.9172
25.14	1.0361	40.66	0.8665
25.94	1.0220		
26.66	1.0112		
27.55	0.9952		
30.71	0.9309		

At 16.8°C	p (mm)	760	1200	1650	2100	2800
(17)	pv	1.0000	0.9796	0.9648	0.9533	0.9335

 p , respectively $p_0 = 1$ atm. (70)

100 α		100 β	
0°C	0 to 100°C	0°C	0 to 100°C
0.403	0.389	0.392	0.385

C₂H₂, Acetylene (150)

p , atm.	pv	
	0°C	25°C
0.5	1.0057	1.0989
1.0	1.0000	1.0937
2.0	0.9891	1.0841
4.0	.9708	1.0684
6.0	.9530	1.0531
8.0	.9360	1.0385
10.0	.9194	1.0255
12.0	.9026	1.0139

C₂H₄, EthyleneValues of $\left(\frac{10^5(v_{t_2} - v_{t_1})}{v_{t_1}(t_2 - t_1)} \right)$ at various pressures (3)

p , atm.	0 to 10°C	10 to 20°C	20 to 30°C	30 to 40°C	40 to 50°C	50 to 60°C	60 to 70°C	70 to 80°C	80 to 90°C	90 to 100°C	100 to 137.5°C	137.5 to 198.5°C
50		4976	1622	1135	902	744	671	585	539	502	406	332
75	948	1714	3826	3500	2136	1355	1019	834	743	663	516	387
100	661	893	1195	1427	2040	1790	1407	1109	945	847	641	438
125	533	696	769	967	1122	1252	1353	1171	972	875	728	478
150	420	566	619	689	799	917	925	945	941	883	733	504
175	377	468	539	555	640	679	744	746	746	781	699	517
200	354	419	467	486	508	583	611	614	620	629	643	506
250	306	346	362	382	406	439	461	464	492	493	509	456

C₂H₄, Ethylene.—(Continued)

<i>p</i> , atm.	0 to 10°C	10 to 20°C	20 to 30°C	30 to 40°C	40 to 50°C	50 to 60°C	60 to 70°C	70 to 80°C	80 to 90°C	90 to 100°C	100 to 137.5°C	137.5 to 198.5°C
300	267	302	305	336	347	351	376	387	392	409	417	397
350	239	265	273	296	297	303	303	335	354	358	352	344
400	212	241	254	261	263	269	274	304	322	324	303	303
450	199	231	234	241	243	249	250	266	281	284	271	275
500	195	227	226	224	230	232	234	242	240	270	243	251
600	177	177	200	199	199	210	203	207	206	216	212	215
700	152	167	177	178	187	185	184	184	191	193	187	188
800	151	154	159	166	167	167	170	173	172	174	172	164
900	148	149	149	149	149	160	157	159	159	157	165	145
1000	138	142	142	145	145	147	147	146	146	150	157	

<i>p</i> , atm.	Values of <i>pv</i> ⁽³⁾							
	0°C	20°C	40°C	60°C	80°C	100°C	137.5°C	198.5°C
1	1.0000							
50	0.1755	0.6290	0.8140	0.9535	1.0770	1.1920	1.3736	1.6520
100	0.3100	0.3600	0.4705	0.6680	0.8465	1.0050	1.2466	1.5800
150	0.4405	0.4850	0.5505	0.6490	0.7760	0.9240	1.1780	1.5400
200	0.5650	0.6095	0.6690	0.7440	0.8380	0.9460	1.1740	1.5368
250	0.6870	0.7325	0.7880	0.8560	0.9370	1.0315	1.2284	1.5690
300	0.8055	0.8520	0.9075	0.9720	1.0475	1.1330	1.3100	1.6276
350	0.9229	0.9690	1.0250	1.0875	1.1580	1.2420	1.4060	1.7010
400	1.0365	1.0840	1.1405	1.2020	1.2725	1.3560	1.5104	1.7900
450	1.1465	1.1975	1.2550	1.3175	1.3865	1.4660	1.6150	1.8858
500	1.2555	1.3075	1.3670	1.4310	1.5000	1.5775	1.7212	1.9846
550	1.3640	1.4165	1.4770	1.5420	1.6115	1.6855	1.8290	2.0868
600	1.4725	1.5250	1.5865	1.6520	1.7215	1.7950	1.9376	2.1910
650	1.5785	1.6325	1.6930	1.7610	1.8305	1.9035	2.0450	2.2950
700	1.6835	1.7375	1.7995	1.8670	1.9365	2.0115	2.1526	2.3990
750	1.7865	1.8420	1.9050	1.9720	2.0420	2.1190	2.2604	2.5030
800	1.8880	1.9460	2.0100	2.0775	2.1495	2.2245	2.3684	2.6060
850	1.9900	2.0495	2.1140	2.1820	2.2555	2.3300	2.4762	2.7104
900	2.0905	2.1530	2.2175	2.2865	2.3595	2.4345	2.5848	2.8104
950	2.1900	2.2535	2.3200	2.3900	2.4635	2.5390	2.6916	
1000	2.2890	2.3535	2.4215	2.4925	2.5660	2.6425	2.7980	

<i>p</i> , atm.	0°C	5°C	7.5°C	10°C	20°C	30°C	40°C	50°C
38	0.5955	0.6490	0.6735					
40	0.5330	0.6155	0.6425	0.6685				
41	0.1610							
42	0.1570	0.5730	0.6085	0.6370	0.7320			
43	0.1580	0.5470						
44	0.1600	0.5150	0.5675	0.6030				
45		0.4770						
46	0.1645	0.1890	0.5100	0.5620	0.6980			
47		0.1850	0.4670		0.6840			
48	0.1695	0.1855	0.3300	0.5075				
49		0.1875	0.2150	0.4700			0.8300	
50	0.1755	0.1900	0.2075	0.4200	0.6290	0.7310	0.8140	0.8865
51				0.2900				
52	0.1810	0.1945	0.2060	0.2400	0.5975			
54			0.2090	0.2290	0.5610	0.6905	0.7810	0.8595
56		0.2050	0.2125	0.2270	0.5235			
58			0.5180	0.2285	0.4805			
60	0.2025	0.2145		0.2315	0.4300	0.6195	0.7285	0.8170
65					0.3310	0.5500	0.6805	
70					0.3110	0.4830	0.6310	0.7430
75	0.2425	0.2535		0.2655	0.3110	0.4300	0.5805	0.7045
80	0.2565			0.2785	0.3165	0.3990	0.5390	0.6660
90					0.3370	0.3915	0.4875	0.6060
100	0.3100			0.3305	0.3600	0.4030	0.4710	0.5665

C₂H₄, Ethylene.—(Continued)

<i>p</i> , atm.	<i>pv</i> (73)	<i>p</i> , atm.	<i>pv</i> (73)
24.95°C		24.95°C	
1	1.0000	65	0.4681
5	0.9745	70	0.4076
10	0.9443	75	0.3666
15	0.9198	80	0.3493
20	0.8818	85	0.3445
25	0.8495	90	0.3466
30	0.8143	95	0.3524
35	0.7764	100	0.3596
40	0.7364	105	0.3679
45	0.6940	110	0.3774
50	0.6467	115	0.3875
55	0.5949	120	0.3975
60	0.5360	125	0.4081

p, respectively *p*₀ = 1 atm. (70)

100α		100β	
0°C	0 to 100°C	0°C	0 to 100°C
0.376	0.3734	0.373	0.3721

COEFFICIENTS OF EXPANSION OF VARIOUS GASES AS CALCULATED BY LEDUC (70)*p*, respectively *p*₀ = 1 atm.

Gas	100α		100β		Experimental values	
	0°C	0 to 100°C	0°C	0 to 100°C	100α	100β
					0 to 100°C	0 to 100°C
CO.....	0.3674	0.3671	0.3671	0.3672	0.3669*	0.3667*
NO.....	0.3677	0.3673	0.3673	0.3671		
N ₂ O.....	0.3761	0.3731	0.3733	0.3718	0.372*	0.368*
HCl.....	0.3769	0.3733	0.374	0.3720		
C ₂ H ₂	0.3771	0.3738	0.3740	0.3725		
PH ₃	0.379	0.375	0.376	0.374		
H ₂ S.....	0.382	0.377	0.378	0.376		
Cl ₂	0.390	0.383	0.383	0.380	0.383†	0.381†
C ₂ N ₂	0.396	0.387	0.387	0.383	0.388*	0.383*
SO ₂	0.398	0.388	0.389	0.384	0.390*	0.384*
(CH ₃) ₂ O.....	0.400	0.391	0.390	0.387		

* Regnault, 20 to 100°C (118).

† Pier (111).

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P-V-T RELATIONS FOR GAS MIXTURES

Components		t, range	p, range	Lit.
A	B			
A	O ₂	At 24.95°C	Up to 125 atm.	(11)
A	N ₂	-200 to -183°C	Up to 1200 mm	(8)
A	C ₂ H ₄	At 24.95°C	Up to 125 atm.	(11)
O ₂	N ₂	At 20° and -141 to -120°C	32 to 56 atm.	(10)
O ₂	CO ₂	9 to 25°C	58 to 140 atm.	(9)
O ₂	C ₂ H ₄	At 24.95°C	Up to 125 atm.	(11)
H ₂	CO ₂	15 to 32°C	30 to 120 atm.	(13)
H ₂	N ₂	0 and 20°C	24 to 205 atm.	(14)
		0-300°C	Up to 1000 atm.	(16, 17)
H ₂ O	NH ₃	98 to 200°C	1 atm.	(15)
H ₂ O	CO ₂	98 to 200°C	1 atm.	(15)
HCl	PH ₃	24 to 54°C	Up to 80 atm.	(1)
HCl	CO ₂	20 to 52°C	30 to 96 atm.	(6)

Components		t, range	p, range	Lit.
A	B			
HCl	C ₂ H ₆	13 to 53°C	32 to 78 atm.	(12)
SO ₂	CH ₃ Cl			(3)
SO ₂	(CH ₃) ₂ O	56, 77, 109°C	6 to 37 atm.	(2)
	Natural gas	15°C	Up to 40 atm.	(4, 5)
	Natural gas	19 to 24°C	Up to 48 atm.	(7)

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N₂, NITROGEN

LOUIS DÉCOMBE

COMPRESSIBILITY

Low Pressures

At 16°C and between $p = 76$ and 152 cm Hg, $\frac{p_0 v_0}{pv} = 1 + 3 \times 10^{-6} (p - p_0)$ (13).

At 14.9°C and between $p_0 = \frac{1}{2}$ and $p = 1$ atm., $\frac{p_0 v_0}{pv} = 1.00015$ (15).

Between $p = 1$ and 1.4 m Hg and with unit of $v = v$ at 0°C and 1 m Hg, $pv = 1.000571 - 0.000571p$, at 0°C; and $pv = 1.366966 + 0.000347p$, at 100°C (4).

Between $p = 1$ and 27 atm., and 4.1 and 5.2°C, $\frac{pv}{p_0 v_0} = 1 + A \left(\frac{v_0}{v} - 1 \right) + B \left(\frac{v_0}{v} - 1 \right)^2$, where $\log_{10} (-A) = 4.8389375$ and $\log_{10} B = 6.8476020$ (16).

High Pressures

MEASUREMENTS BY AMAGAT (1); cf. (19, 20)

Volume unit = v at 0° and 1 atm.

p, atm.	pv			p, atm.	pv		
	0°	16.0°	43.6°		0°	16.0°	43.6°
1	1.0000			1600	2.8456	2.9088	3.0264
100	0.9910			1700	2.9665	3.0328	3.1509
200	1.0390			1800	3.0861	3.1536	3.2715
300	1.1360			1900	3.20815	3.2765	3.3962
400	1.2570			2000	3.3270	3.3980	3.5170
500	1.3900			2100	3.4461	3.5175	3.6361
600	1.5260			2200	3.5640	3.6366	3.7554
700	1.6625			2300	3.6823	3.7536	3.8720
800	1.8016	1.8648		2400	3.8004	3.8724	3.9924
900	1.9368	2.0016	2.1186	2500	3.9200	3.9900	4.1100
1000	2.0700	2.1340	2.2420	2600	4.0378	4.1054	4.2276
1100	2.20385	2.2682	2.3782	2700	4.1553	4.2228	4.3416
1200	2.3352	2.4000	2.5140	2800	4.2700	4.3386	4.4576
1300	2.46545	2.5285	2.6455	2900	4.3558	4.4544	4.5733
1400	2.5942	2.6558	2.7748	3000	4.4970	4.5675	4.6890
1500	2.72025	2.7810	2.8995				

Unit of $v = v$ at 16° and 1 atm.

p, atm.	pv, 16.0°	p, atm.	pv, 16.0°	p, atm.	pv, 16.0°	p, atm.	pv, 16.0°
1	1.0000	65	0.9897	130	1.0050	240	1.0783
5	0.9987	70	0.9900	135	1.0076	250	1.0867
10	0.9971	75	0.9904	140	1.0103	260	1.0954
15	0.9957	80	0.9908	145	1.0131	270	1.1048
20	0.9945	85	0.9914	150	1.0160	280	1.1145
25	0.9933	90	0.9921	160	1.0221	290	1.1243
30	0.9923	95	0.9930	170	1.0284	300	1.1340
35	0.9914	100	0.9941	180	1.0349	320	1.1552
40	0.9907	105	0.9953	190	1.0414	340	1.1765
45	0.9901	110	0.9967	200	1.0483	360	1.1990
50	0.9897	115	0.9984	210	1.0555	380	1.2215
55	0.9895	120	1.0004	220	1.0627	400	1.2445
60	0.9896	125	1.0026	230	1.0703	430	1.2785

VALUES OF $p_{\text{atm.}}$ AT CONSTANT v

v, const.	p, atm.			v, const.	p, atm.			
	0°	16.0°	43.6°		0°	16.03°	99.45°	199.5°
0.002070	1000	1088	1239	0.009910	100	107	146	192
.001946	1200	1298	1474	.005195	150	162	225	299
.0018135	1500	1613	1812	.004330	200	217	307	414
.0017145	1800	1937	2168	.003786	250	273	392	530
.0016635	2000	2150	2401	.003414	300	328	474	644
.0015835	2400	2572	2858	.003142	350	383	556	758
.001525	2800	2990		.002940	400	439	637	869
				.002780	450	494	718	
				.002652	500	548	797	
				.002543	550	602	875	
					600	656	957	

MEASUREMENTS BY BARTLETT (19, 20)

p, atm.	pv					
	0°	50°	99.85°	198.9°	299.8°	399.3°
1	1.0000					
50	0.9846	1.1888	1.3888	1.7683		
100	0.9846	1.2046	1.4114	1.8071	2.1978	2.5729
200	1.0362	1.2742	1.4958	1.9073	2.3119	2.6944
300	1.1335	1.3711	1.5971	2.0169	2.4279	2.8166
400	1.2557	1.4870	1.7112	2.1407	2.5498	2.9422
600	1.5214	1.7473	1.9650	2.3914	2.8034	3.1949
800	1.7959	2.0155	2.2273	2.6510	3.0615	3.4559
1000	2.0641	2.2825	2.4942	2.9165	3.3195	3.7196

INTERNATIONAL CRITICAL TABLES

MEASUREMENTS BY HOLBORN AND OTTO (11)

Volume unit = v at 0° and 1 m Hg

p , m Hg	pv									
	-130°	-100°	-50°	0°	+50°	100°	150°	200°	300°	400°
0	0.52446	0.63434	0.81747	1.00060	1.18368	1.36682	1.54996	1.73308	2.09934	2.46558
1	0.51975	.63129	.81593	1.00000	1.18367	1.36718	1.55064	1.73398	2.10055	2.46696
5				0.99768	1.18370	1.36870	1.55340	1.73763	2.10542	2.47250
10	0.47496	.60359	.80255	.99505	1.18391	1.37074	1.55695	1.74225	2.11154	2.47947
15				.99269	1.18431	1.37294	1.56060	1.74696	2.11770	2.48648
20	0.41826	.57249	.78881	.99060	1.18490	1.37529	1.56436	1.75174	2.12389	2.49352
25				.98878	1.18567	1.37780	1.56823	1.75660	2.13012	2.50061
30	0.35164	.54171	.77633	.98723	1.18664	1.38047	1.57220	1.76154	2.13639	2.50773
35				.98595	1.18780	1.38330	1.57628	1.76656	2.14270	2.51490
40	0.28066	.51235	.76526	.98494	1.18915	1.38629	1.58047	1.77166	2.14905	2.52211
45				.98420	1.19069	1.38943	1.58477	1.77684	2.15543	2.52936
50	0.23436	.48600	.75580	.98374	1.19241	1.39273	1.58917	1.78209	2.16185	2.53664
55				.98354	1.19433	1.39618	1.59367	1.78743	2.16830	2.54397
60		.46465	.74822	.98361	1.19644	1.39980	1.59829	1.79284	2.17480	2.55134
65				.98395	1.19873	1.40357	1.60301	1.79833	2.18133	2.55875
70		.45076	.74285	.98457	1.20122	1.40750	1.60784	1.80390	2.18790	2.56620
75				.98545	1.20390	1.41159	1.61278	1.80956	2.19451	2.57369
80		.44719	.74005	.98662	1.20676	1.41584	1.61782	1.81528	2.20115	2.58152

MEASUREMENTS BY KAMERLINGH ONNES AND URK (14)

Volume unit = v at 0° and 1 pressure unit. Pressure unit = 759.778 mm Hg at 0° at the pavilion of Breteuil

p	pv										
	+20.00°	0.00°	-23.62°	-50.26°	-81.10°	-102.25°	-121.19°	-131.27°	-141.53°	-144.46°	-146.32°
22											0.3400
24								0.4225	0.3605	0.3395	.3260
26							0.4700	.4135	.3470	.3247	.3090
28						0.5590	.4625	.4045	.3332 ₅	.3080	.2895
30					0.6523	.5540	.4550	.3945	.3180	.2892	.2670
32				0.7832	.6489	.5490	.4475	.3845	.3015	.2675	.2385
34	1.0682	0.9890	0.8920	.7812	.6455	.5441	.4400	.3745	.2825	.2400	.1800
36	1.0679	.9883	.8909	.7792	.6422	.5392	.4325	.3635	.2615	.2000	.1063
38	1.0676	.9876 ₅	.8899	.7773	.6389	.5344	.4250	.3525	.2360	.1425	
40	1.0673	.9870	.8890	.7754	.6356	.5296	.4175	.3415	.2065	.1225	
42	1.0670 ₅	.9864 ₅	.8880	.7736	.6324	.5249	.4100	.3300	.1750	.1207	
44	1.0668 ₅	.9859	.8871	.7717	.6293	.5202	.4025	.3175			
46	1.0667	.9853 ₅	.8861	.7699	.6262	.5156		.3055		p	-148.58°
48	1.0666	.9848	.8852	.7681	.6232	.5109		.2940		28	0.2625
50	1.0665	.9843 ₅	.8842	.7664	.6202	.5063		.2825		29	0.2502
52	1.0665	.9839	.8833	.7648	.6173			.2715		30	0.2325
54	1.0665 ₅	.9835 ₅	.8824	.7632	.6145			.2610		30.4	0.2207
56	1.0667	.9832	.8815	.7616	.6118			.2517		30.8	0.1900
58	1.0668	.9829	.8806	.7600	.6092			.2432			
60	1.0670	.9826	.8796								
62	1.0672										
64	1.0674										

MEASUREMENTS AT 68°C BY BRIDGMAN (3)

p , kg/cm ²	v , cm ³ /g	pv^*	p , kg/cm ²	v , cm ³ /g	pv^*
2 500	1.356	4.11	9 000	1.003	10.94
3 000	1.290	4.68	10 000	0.982	11.91
4 000	1.201	5.82	11 000	.964	12.84
5 000	1.138	6.89	12 000	.948	13.78
6 000	1.093	7.95	13 000	.933	14.70
7 000	1.056	8.95	14 000	.920	15.60
8 000	1.026	9.94	15 000	.908	16.50

* Volume unit = v at 0°C and 1 kg/cm².

Empirical Formulae

FORMULAE OF HOLBORN AND OTTO (11)

Pressure unit = m Hg. Volume unit = v at 0° and 1 m Hg

$$pv = A + Bp + Cp^2 + Dp^3 + Ep^4 \quad (1)$$

$$\left(\frac{\partial(pv)}{\partial p}\right)_{p=0} \times 10^5 = B \times 10^5 = a + b\theta + \frac{c}{\theta} + \frac{e}{\theta^3} \quad (2)$$

t , °C	A	10 ⁵ B	10 ⁶ C	10 ⁵ D	10 ¹² E
-130	0.52446	-4.68594	-24.4699	-20.2026	8.4248
-100	0.63434	-3.04600	-3.0667	+1.8603	
-50	0.81747	-1.54934	+5.7092	0.2438	

FORMULAE OF HOLBORN AND OTTO (11).—(Continued)

$t, ^\circ\text{C}$	A	10^3B	10^6C	Equation (2)	
0	1.00060	-0.60716	5.4056	a	357.46
+ 50	1.18368	-0.01514	3.7959	b	- 9.36
100	1.36682	+0.36057	3.1510	c	-1044.84
150	1.54996	0.67717	2.1389	e	- 242.53
200	1.73308	0.90133	1.5778	$\theta = \frac{t + 273}{100}$	
300	2.09934	1.21257	0.7510		
400	2.46558	1.38086	0.8082		

FORMULA OF R. BECKER (2)

Based upon the measurements of Amagat at 0 and 16°C and between 0 and 3000 atm. Holds accurately up to the highest pressures and yields correct values for t_c and d_c .

$$p = \frac{RT}{v} \left(1 + \frac{k}{v} e^{\frac{k}{v}} \right) - \frac{a}{v^2} + \frac{x}{v^{\beta+2}}$$

	R	k	a	x	β
1*	$\frac{1}{273}$	0.001801	0.00250	1.34×10^{-17}	5
2†	8.31×10^7	40.3	1.26×10^{12}	384×10^{17}	5

* For p in atm. and volume unit = v at 0° and 1 atm.

† For 1 g-mole, p in baryes and v in cm^3 .

FORMULA OF VERSCHOYLE (18)

Pressure unit = 759.778 mm Hg at 0°C at the pavilion of Breteuil.

Volume unit = v at 0° and 1 pressure unit. $pv = A + Bp + Cp^2$.

For $t = 0^\circ$, $A = 1.00049$, $B = 0.4961 \times 10^{-3}$, $C = 3.334 \times 10^{-6}$.

For $t = 20^\circ$, $A = 1.07370$, $B = -0.2798 \times 10^{-3}$, $C = 2.800 \times 10^{-6}$.

For range, and deviation graph, see Fig. 1.

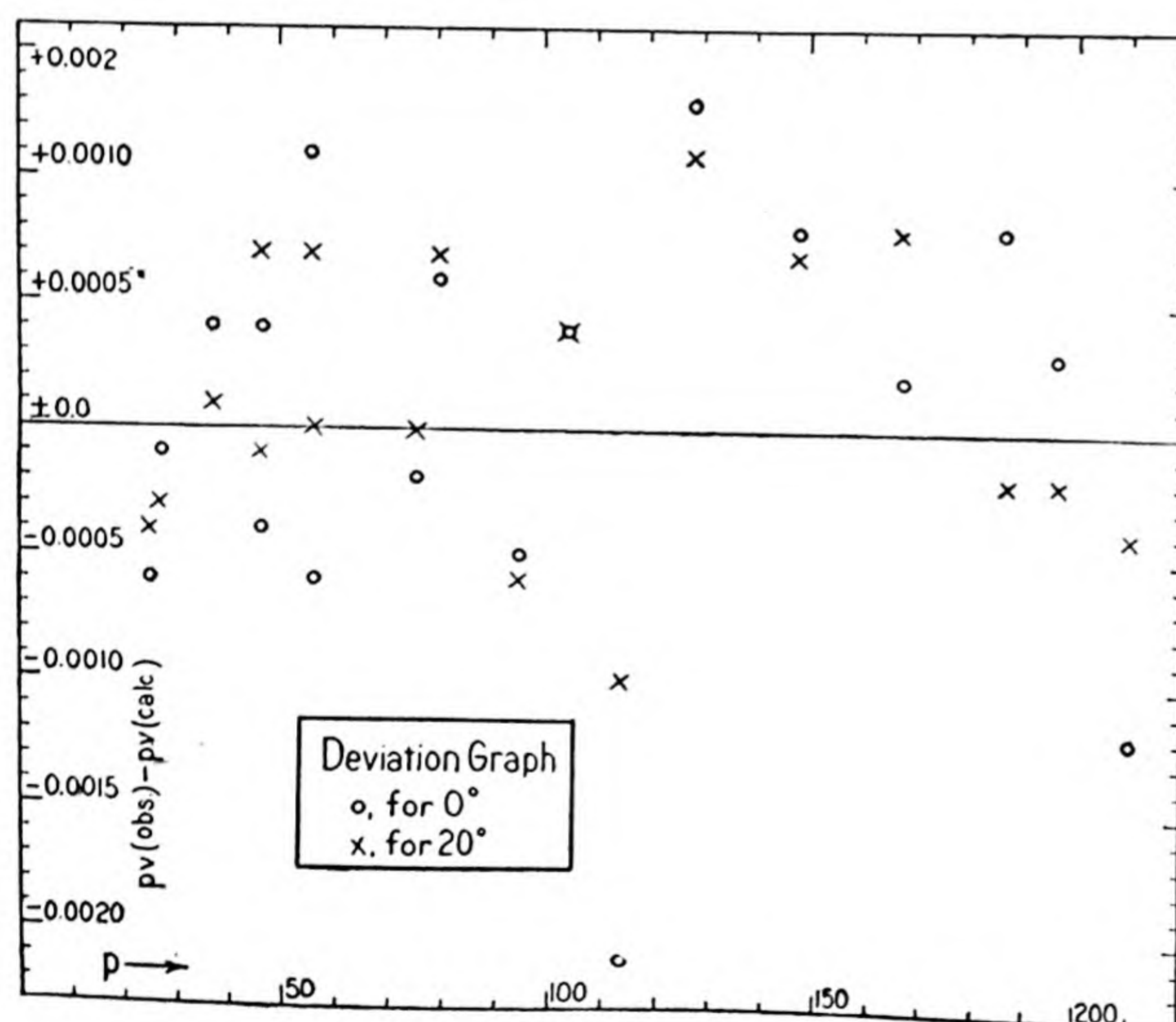


FIG. 1.

Virial Coefficients

$$pv = A \left(1 + \frac{B}{v} + \frac{C}{v^2} + \dots \right)$$

Pressure unit = 759.778 mm Hg at 0°C, at the pavilion of Breteuil.
Volume unit = v at 0°C and 1 pressure unit

Kamerlingh Onnes and Urk (17)

$t, ^\circ\text{C}$	A	10^3B	10^6C
+ 20	1.07370	-0.24448	2.3284
0	1.00041	-0.40996	2.06556
- 23.62	0.913901	-0.74651	3.057
- 50.26	.816309	-1.10626	2.680
- 81.10	.703330	-1.74585	3.513
-102.25	.625850	-2.34448	4.167
-121.19	.556465	-3.11693	5.367
-131.27	.519539	-3.60025	5.7245
-141.53	.481953	-4.21676	6.455
-144.46	.471218	-4.38627	6.911
-146.32	.464395	-4.54174	6.664

Holborn and Otto (10)

400	2.46522	1.04930	2.2523
300	2.09903	0.92142	1.7599
200	1.73283	0.68491	2.0487
150	1.54973	0.51457	2.1797
100	1.36662	+0.273995	2.5627
+ 50	1.18368	-0.01150	2.5954
0	1.00045	-0.46137	3.3371
- 50	0.81735	-1.17733	4.0822
-100	0.63425	-2.31462	4.2354
-130	0.52438	-3.56079	5.2703

Thermal Expansion

$$\alpha = \frac{v_2 - v_1}{v_1 t} \text{ at the constant pressure } p_1, \text{ cm Hg}$$

$$\beta = \frac{p_2 - p_1}{p_1 t}, \text{ at constant volume, the initial pressure being } p_1, \text{ cm Hg}$$

p_1	53.05	79.35	100.19	100.19	100.19	138.68
$t, ^\circ\text{C}$	100	100	20	40	100	100
$10^7\alpha$ =			36 770	36 750	36 732	36 778
$10^7\beta$ =	36 685	36 720	36 754	36 752	36 744	(4)

At $t = 100^\circ\text{C}$

p_1	$10^7\beta$	p_1	$10^6\beta$	p_1	$10^7\alpha$	p_1	$10^7\beta$
79.35	36 718	98.5	3 673	79.2	36 701	65.4	36 696
53.3	36 685	74.4	3 670	75.7	36 699		
52.9	36 681	55.0	3 668	41.5	36 659		
39.2	36 677	31.4	3 665	39.5	36 656		
Lit.	(5)	Lit.	(6)	Lit.	(7)	Lit.	(12)

p_1	110.5	51.1	22.0	p_1	110.5	51.1	22.0	Lit.
$10^7\alpha$	36 742	36 679	36 630	$10^7\beta$	36 752	36 675	36 626	(8)

MEASUREMENTS BY AMAGAT (1)

Const. press., atm.	$\frac{10^5 \Delta v}{v \Delta t}$		Const. press., atm.	$\frac{10^5 \Delta v}{v \Delta t}$		Const. press., atm.	$\frac{10^5 \Delta v}{v \Delta t}$	
	Δt			Δt			Δt	
	0-100°	100-200°		0-100°	100-200°		0-16°	0-44°
200	433	280	600	282	219	1000	193	191
300	402	267	700	256	204	1500	140	151
400	358	250	800	236	189	2000	133	131
500	315	235	900	218	179	2500	111	108
						3000	98	98

p at 0°, (atm.)	Const. vol.*	$\frac{10^5 \Delta p}{p \Delta t}$		p at 0°, (atm.)	Const. vol.*	$\frac{10^5 \Delta p}{p \Delta t}$	
		Δt				Δt	
		0-100°	100-200°			0-16°	0-44°
100	0.009910	462	315	1000	0.0020700	550	548
200	.005195	537	349	1200	.0019460	510	524
300	.003786	582	359	1500	.0018135	471	477
400	.003142	595	364	1800	.0017145	475	469
500	.002780	596		2000	.0016635	468	460
600	.002543	597		2400	.0015835	448	437
				2800	.0015250	424	

* Volume unit = v at 0° and 1 atm.

Values of $\left(\frac{\partial p}{\partial t}\right)_v$ at 16°C

p , atm.	10	25	50	100	150	200	250	300	350	400	450
$\left(\frac{\partial p}{\partial t}\right)_v$	0.04	0.10	0.21	0.45	0.735	1.073	1.405	1.73	2.05	2.35	2.61

MEASUREMENTS BY HOLBORN AND OTTO (9, 10)

p , m Hg	Values of $10^7(v_t - v_0)/v_0 t$								
	400°	300°	200°	150°	100°	+50°	-50°	-100°	-130°
0	3660.4	3660.4	3660.4	3660.4	3660.3	3660.2	3660.4	3660.4	3660.4
1	3667.4	3668.5	3669.9	3670.9	3671.8	3673.4	3681.4	3687.1	3694.2
5	3695.6	3701.1	3708.4	3713.4	3718.8	3729.1			
10	3729.5	3740.1	3754.7	3764.6	3775.6	3796.0	3869.2	3934.1	4020.6
15	3761.9	3777.6	3799.3	3814.0	3830.5	3860.7			
20	3793.0	3813.5	3841.8	3861.4	3883.4	3922.8	4074.1	4220.8	4444.4
25	3822.5	3847.6	3882.6	3906.8	3934.4	3982.6			
30	3850.4	3880.1	3921.6	3950.2	3983.2	4039.8	4272.6	4512.8	4952.4
35	3876.8	3910.8	3958.6	3991.7	4030.1	4094.6			
40	3901.7	3939.7	3993.7	4030.9	4074.8	4146.7	4460.8	4798.2	5500.3
45	3924.9	3966.8	4026.8	4068.2	4117.4	4196.0			
50	3946.4	3991.9	4057.8	4102.9	4157.5	4242.4	4634.2	5059.7	5859.8
55	3966.4	4015.3	4086.8	4135.6	4195.5	4286.4			
60	3984.6	4036.8	4113.7	4166.1	4231.3	4327.5	4786.2	5276.1	
65	4001.2	4056.4	4138.4	4194.5	4264.7	4365.7			
70	4016.0	4074.0	4160.9	4220.3	4295.6	4400.9	4910.2	5421.8	
75	4029.2	4089.7	4181.5	4243.9	4324.3	4433.5			
80							4998.3	5467.5	

$\frac{1}{v}$	Values of $10^7(p_t - p_0)/p_0 t$; const. vol. (9)					
v	400°	300°	200°	150°	100°	50°
0	3660.4	3660.4	3660.4	3660.4	3660.3	3660.2
1	3672.5	3672.9	3673.2	3673.3	3673.1	3673.2
5	3721.3	3723.4	3724.9	3725.8	3725.2	3727.9
10	3782.3	3786.3	3789.4	3791.1	3790.4	3796.0
15	3843.2	3848.4	3853.4	3856.1	3855.4	3863.5
20	3904.0	3910.5	3917.5	3920.9	3920.7	3930.8
25	3964.8	3972.4	3981.1	3985.4	3986.0	3997.5
30	4025.5	4033.0	4044.4	4049.5	4051.2	4063.8
35		4093.5	4107.2	4113.1	4116.1	4129.6
40			4169.6	4176.5	4181.2	4195.0
45			4231.6	4239.0	4245.8	4259.3
50					4310.3	4323.3
55					4373.5	4386.4
60						4448.7
65						4509.8
70						4570.9

* Volume unit = v at 0° and 1 m Hg.

LITERATURE

(For a key to the periodicals see end of volume)

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DENSITY AND THERMAL EXPANSION OF NON-METALLIC ELEMENTARY SUBSTANCES UNDER ATMOSPHERIC PRESSURE

A. W. PORTER

The values given are density in g/ml = specific gravity, $t/4$ (in vacuo) and coefficients of expansion.

I. THE LIQUID STATE*

A.—1.37396 at -183.15° (49). $\frac{10^3}{V} \left(\frac{dV}{dt}\right)_{P=1 \text{ atm.}} = 4.65 \pm 0.15$ at -183° (3, 49); *v. further* p. 203.

Br	0°	20°	25°	30°
	3.1875	3.1193	3.1023	3.0848

$\frac{10^3}{V} \left(\frac{dV}{dt}\right)_{0^\circ} = 1.1_1(1, 62, 63, 81)$; *cf.* (18, 66)

Cl.— $d_4^t = [(1.468 - 2.89 \times 10^{-3}t - 5.3 \times 10^{-6}t^2) \pm 1\%]$ between -100 and 144° ; liquid under its own vapor pressure above the B. P. (36, 41, 60); *v. further* p. 202.

Δt , °C†	-80 to -33.6	-30 to 0	5-10	15-20	25-30	35-40	50-60	70-80	Lit.
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$\frac{10^3 \Delta V}{V \Delta t}$	1.49	1.793	1.978	2.030	2.190	2.260	2.690	3.460	(36)
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t , °C	-40	-30	-20	-10	0	+10	20	30
$\frac{10^3 dV}{V dt}$	1.53	1.58	1.65	1.75	1.87	1.99	2.12	2.26

t , °C	40	50	60	70	80	90	100	Lit.
$\frac{10^3 dV}{V dt}$	2.42	2.59	2.78	3.01	3.33	3.76	4.30	(41)

F.—1.14 at -200° (54); 1.108 at B. P., -187°C (24). $\frac{10^3 \Delta V}{V \Delta t} = \text{ca. } 3$, between -210 and -187°C (24).

* For orthobaric densities, *v. p.* 202, 203.

† Atmospheric pressure.

H.— $d_4^{T_K} = 0.084404 - 223 \times 10^{-6} T_K - 21.83 \times 10^{-6} T_K^2$, where T_K is the absolute temperature on the Leiden scale (Vol. I, p. 54) on which the triple point is 13.95° and 51.4 mm Hg ($d = 0.07709$) and the B. P. is 20.35° ($d = 0.07085$) (58). $\frac{10^3}{V} \left(\frac{\Delta V}{\Delta t}\right)_{P=P} = 12.6$ between $T_K = 13.99^\circ$ and $T_K = 20.39^\circ$ (58); *v. further* p. 203. The above value at the B. P. is confirmed by Augustin (2). He.—0.1255 at -268.88°C (56); *v. further* p. 203.

I (24)	t , °C	107°	110°	120°	130°	140°
	d_4^t	4.004	3.991	3.960	3.929	3.898
	t , °C	150°	160°	170°	180°	184.35°
	d_4^t	3.864	3.826	3.796	3.736	3.706

Kr.—2.155 at *ca.* -146°C (70); *v. further* p. 204.

N.—0.8084 \pm 0.003 at the B. P., -195.78°C ; $d_4^t = 1.1604 - 0.00455(t + 273)$ (range -182 to -210°); $\frac{10^3 \Delta V}{V \Delta t}$ between -184 and $-205^\circ = 6.0$ (3, 50); *v. further* p. 204.

Ne.—1.204 at B. P., -245.92° (15); *v. further* p. 204.

O.—1.447 at the B. P., -182.95°C ; $\frac{10^3 \Delta V}{V \Delta t}$ between -182 and $-210^\circ = 4.0$ (3, 48).

t , °C	-210	-205	-200	-195
d_4^t	1.2726	1.2489	1.2248	1.2008
t , °C	-190	-185	-182	Lit.
d_4^t	1.1767	1.1527	1.1385	(3)

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$t, ^\circ\text{C}$	-210.4	-182.0	-154.51	-140.2
d_4^t	1.2746	1.1415	0.9758	0.8742
$t, ^\circ\text{C}$	-129.9	-123.3	-120.4	Lit.
d_4^t	0.7781	0.6779	0.6032	(48)

O₃ (Ozone).— 1.71 ± 0.05 ; $\frac{10^3 dV}{V dt} = 2.0$ at -183° ; $= 2.5$ at -112.4° ; $\frac{1}{d_4^t} = 0.512 + 456 \times 10^{-6} (t + 273.1) + 3.93 \times 10^{-6} (t + 273.1)^2$, from -213 to -83°C (73, 77).

P (28, 32, 59, 69)	$t, ^\circ\text{C}$	44.5	100	ca. 280 B. P.	40	100	200	280
	d_4^t	1.745	1.69	1.485	1.7492	1.6949	1.6027	1.5287

$$\frac{10^5 \Delta V}{V \Delta t} = 52, (50-60^\circ) \text{ (64).}$$

Rn.—4.40 at B. P. -62°C (10).

S.— $d_4^{113} = 1.8114$ (84); $d_4^{146} = 1.4579$ to 1.5130 (mean 1.480) (68).

t	115.1	122.2	134.0	138.2	145.5
d_4^t	1.8084-1.8094	1.8028	1.7921-1.7938	1.7905	1.7807-1.7846

t	151.5	156.9	158.5	161.0	165.0
d_4^t	1.7761-1.7794	1.7747	1.7710-1.7739	1.7704-1.7733	1.7724

t	171.3	178.3	184.0	210.0	239.5
d_4^t	1.7705	1.7681	1.7632-1.7651	1.7505-1.7511	1.7307-1.7341

t	278.5	357.0	445.0	Lit.
d_4^t	1.7072-1.7119	1.6563-1.6620	1.5994-1.6140	(35)

t	115-134	134-138.2	138.2-145.5	145.5-151.5	151.5-156.9
$\frac{10^6 \Delta V}{V \Delta t}$	430	439	465	487	490

t	156.9-158.5	158.5-161	161-165	165-171.3	171.3-178.3
$\frac{10^6 \Delta V}{V \Delta t}$	282	135	127	170	194

t	178.3-184	184-210	210-239.5
$\frac{10^6 \Delta V}{V \Delta t}$	298	308	344

t	239.5-278.5	278.5-357	357-445	Lit.
$\frac{10^6 \Delta V}{V \Delta t}$	366	366	338	(35); cf. (53, 61)

Xe.—3.063 at B. P., -106.9°C (59); *v. further* p. 204.

II. THE CRYSTALLINE STATE

A.— 1.65 ± 0.02 at 40°K (from crystal structure) (78).

Br.—Reliable data lacking; Pierre (62) finds *ca.* 6% decrease in volume on crystallization.

C (Diamond).— d_4^{20} varies with the specimen 3.47 to 3.56 (85). For graphite, *v.* Vol. II, p. 592.

-163.6°	-38°	18°	Room
3.519 (12)	3.510 (12)	3.514 (12)	3.518 (85)
t (26)	20°	40°	50°
$\frac{10^6 dl}{l dt}$	0.89	1.18	1.32

H.—0.08077 at -262.0° (58); 0.0763 at -259.9° (22); the former value implies a contraction of 4.8% on crystallization.

I.—Iodine.

(40)	(4)	(71)	(6)
4°	19°	20°	40°
4.933	4.911	4.940	4.918
4.903	4.886	4.871	4.856
4.841	4.830	4.825	

N.—1.0265 at -252.5° (22).

O.—1.4256 at -252.5° (22).

P.—Much confusion in results and conclusions of different investigators; *v.* especially (8, 13).

Type	d_4^t	$t, ^\circ\text{C}$	Lit.
White: octahedral.....	1.8177	13	(83)
rhombic.....	1.8272	13	(83)
P _I	1.83		(44, 45)
Yellow.....	1.828		(85)
Red: P _{II}	2.34		(44, 45)
light red by heat at 280°	2.16		(44, 45)
pyromorphic.....	2.18	0	(32)
by heating red at 360°	2.37	0	(32)
	2.296		(85)
	2.28-2.31	18	(13)
Hittorf's metallic.....	2.33	15.5	(29)
	2.31-2.33		(80)
Metallic.....	2.19-2.23	18	(13)
Violet (by heating red at 560°).....	2.36	20	(46)
Black (by heating metallic to 200° at 12 000 atm.).....	2.69	20	(9)

See also (7, 27, 28, 37, 42, 76, 79, 82).

$$\frac{10^6 dl}{l dt} = 125, 0 \text{ to } 40^\circ \text{ (64).}$$

S.—Rhombic: $\frac{10^6 dl}{l dt} = 64.13$ at 40° ; mean $0-100^\circ = 67.48$

(26). $\frac{10^6 \Delta V}{V \Delta t} = 11.52, -188 \text{ to } 17^\circ$ (21); *cf.* (39).

Type	d_4^t	$t, ^\circ\text{C}$	Lit.
Rhombic.....	2.0989	-188	(21)
	2.0522	17	(21)
	2.06		(85)
M. P., 112.8°C	2.07		(72)
	2.135		(25)
	2.01-1.99		(61)
Natural.....	2.0784	0	(63)
	2.070	Rm.	(19)
Crystalline from CS ₂	2.063	Rm.	(19)
	2.045		(47)
Monoclinic.....	1.96	Rm.	(85)
M. P., 119°C	1.94		(61)
Amorphous.....	1.87		(61)
	1.92-1.93	Rm.	(19)
Soluble in CS ₂	1.86	Rm.	(85)
Insoluble in CS ₂	1.89	Rm.	(85)

Se.—*See the literature for details.*

Type	d_4^t	$t, ^\circ\text{C}$	Lit.
Insoluble in CS ₂ —metallic.....	4.80-4.82	17	(14)
	4.80	Rm.	(74)
Insoluble in CS ₂ —crystalline.....	4.80		(85)
	4.455	17	(14)
Soluble in CS ₂ —crystalline.....	4.46		(61)
	4.47	Rm.	(74)
	4.302	17	(14)
Amorphous.....	4.26-4.28	Rm.	(74)
	4.29		(61)
	4.28	20	(72)
Heated not higher than necessary for crystallization.....	4.5-4.6		(39)
Melted.....	4.80		(39)
Then heated to 125°	4.77		(39)
	4.57	19	(4)

Se.—(Continued)

$t, ^\circ\text{C}$	$\frac{10^6 dl}{l dt}$	Lit.
0	43.9	(23)
-40	40.4	
-80	36.9	
-120	33.5	
-160	32.4	
0 to 100	37.92	
40	36.80	

Te.—Varies with mode of preparation, *v.* (11, 16, 17).

Type	d_4^t	$t, ^\circ\text{C}$	Lit.
Amorphous.....	6.022–6.150	25	(11)
Amorphous.....	5.85–5.87		(16, 17)
Amorphous, ppt.....	5.97–6.08		(5)
Same, preheated to 430°.....	6.04–6.20		(5)
Cast, cooled slowly.....	6.30–6.39		(5)
Same, preheated to 430°.....	6.29–6.34		(5)
Pptd. from alk. solns.....	6.07–6.21		(5)
Pptd. from alk. solns., preheated to 430°.....	6.06–6.16		(5)
Cast, quickly cooled.....	6.10–6.22		(5)
Pptd. from alk. solns.....	5.95–6.06	25	(11)
Crystalline needles.....	6.310		(16, 17)
Crystalline.....	6.235	20	(34)
Crystalline.....	6.281	19	(4)
	6.246	18.2	(67)

$$\frac{10^6 dl}{l dt} = 16.75 \text{ at } 40^\circ; \text{ mean } (0-100^\circ) = 17.32 \text{ (26).}$$

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(For a key to the periodicals see end of volume)

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DENSITY AND THERMAL EXPANSION OF INORGANIC COMPOUNDS IN THE LIQUID (INCLUDING VITREOUS) STATE UNDER ONE ATMOSPHERE

G. P. BAXTER

B-TABLE

Standard arrangement (*v. p. viii*)

Substance	$d_4^t = d_0 + at + bt^2 + \dots$ (range, $^\circ\text{C}$)	Lit.
² H ₂ O	<i>v. p.</i> 24	
H ₂ O ₂	$d_4^t = 1.4632 - 0.00117t + 0.055t^2$ (-12 to 20)	(48)
HCl	$d_4^t = 0.923 - 0.00318t$ (-104 to -83)	(77)
HClO ₄	$d_4^t = 1.806 - 0.001927t$ (20 to 50)	(91, 93)
HBr	$d_4^t = 1.549 - 0.00885t$ (-88 to -69)	(77)
HI	$d_4^t = 2.371 - 0.012t$ (-50 to -36)	(77)
ICI	$d_4^t = 3.1822 - 0.002914t - 0.0761t^2 - 0.043t^3$ (24 to 90)	(84)
	$d_4^t = 3.278 - 0.00327t$ (24 to 100)	(28)
SO ₂	$d_4^t = 1.4350 - 0.0025t - 0.05112t^2$ (-50 to -10)	(41)
	$d_4^t = 1.998 - 0.00466t$ (15 to 46)	(72)
SO ₃	$d_4^t = 1.9962 - 0.003235t - 0.04215t^2$ (15 to 46)	(44)
	$d_4^t = 1.9982 - 0.003193t - 0.04222t^2$ (15 to 46)	(8)
H ₂ S	$d_4^t = 0.866 - 0.001629t$ (-82 to -63)	(77)
H ₂ SO ₄	$d_4^t = 1.854 - 0.0498t$ (0 to 76)	(19, 35, 37, 49, 51, 58, 62, 73)

B-TABLE.—(Continued)

Substance	$d_4^t = d_0 + at + bt^2 + \dots$ (range, $^\circ\text{C}$)	Lit.
⁸ S ₂ Cl ₂	$d_4^t = 1.7094 - 0.001596t + 0.067t^2 - 0.0847t^3$ (0 to 136)	(84)
	$d_4^t = 1.7055 - 0.001634t + 0.0514t^2 - 0.0895t^3$ (12 to 111)	(38)
SOCl ₂	$d_4^t = 1.6767 - 0.001951t + 0.065t^2 - 0.07117t^3$ (0 to 69)	(84)
SO ₂ Cl ₂	$d_4^t = 1.7081 - 0.0021t + 0.05107t^2 - 0.07181t^3$ (0 to 70)	(84)
	$d_4^t = 1.7045 - 0.00160t$ (0 to 50)	(60)
S ₂ O ₃ Cl ₂	$d_4^t = 1.8585 - 0.001796t - 0.0631t^2 - 0.07225t^3$ (0 to 100)	(84)
	$d_4^0 = 1.872$; $d_4^{20} = 1.837$	(71)
	$d_4^0 = 1.873$; $d_4^{18} = 1.839$	(64)
SO ₃ HCl	$d_4^t = 1.7847 - 0.001615t + 0.05121t^2 - 0.0641t^3$ (0 to 100)	(71, 84)
H ₂ Se	$d^{-42} = 2.12$	(21)
H ₂ Te	$d^{-20} = 2.57$	(22)
¹¹ NO	$d^{-150.2} = 1.269$	(1)

B-TABLE.—(Continued)

Substance	$d_4^t = d_0 + at + bt^2 + \dots$ (range, °C)	Lit.
11 NO ₂	$d_4^t = 1.4903 - 0.00238t - 0.0648t^2 - 0.0637t^3$ (0 to 20)	(85)
N ₂ O	$d_4^t = 1.496 - 0.00148t$ (-5 to 15)	(24)
N ₂ O ₃	$d_4^t = 1.490 - 0.00209t$ (0 to 22)	(57)
NH ₃	$d_4^t = 1.4905 - 0.00204t - 0.0693t^2$ (0 - 21)	(95)
HNO ₃	$d_4^{25.4} = 1.2257$	(26)
NOCl	$d_4^t = 1.450 - 0.0017t$ (-8 to 2)	(24)
12 PH ₃	$d_4^t = 0.6386 - 0.00134t - 0.041365t^2$ (-78 to -33)	(14, 87)
PCl ₃	$d_4^t = 0.6387 - 0.001365t - 0.05163t^2$ (-50 to -33)	(34)
POCl ₃	$d_4^t = 1.5300 - 0.0014t$ (0 to 30)	(57)
PBr ₃	$d_4^t = 1.5501 - 0.00203t + 0.055t^2$ (4 to 24)	(89)
POBrCl ₂	$d_4^t = 1.349 - 0.00242t$ (-48 to 0)	(10)
PSCl ₃	$d_4^t = 0.693 - 0.036t$ (-106 to -80)	(77)
PBrCl ₂	$d_4^t = 1.6162 - 0.001828t + 0.06706t^2 - 0.07238t^3$ (-36 to 75)	(61)
PSCl ₃	$d_4^t = 1.6128 - 0.001869t + 0.06184t^2 - 0.08792t^3$ (0 to 76)	(84)
POCl ₃	$d_4^t = 1.6128 - 0.001733t + 0.0332t^2 + 0.07233t^3$ (-80 to 0)	(36)
PBrCl ₂	$d_4^t = 1.6094 - 0.00134t + 0.0612t^2$ (-90 to 0)	(87)
PSCl ₃	$d_4^t = 1.7116 - 0.001839t + 0.06166t^2 - 0.0855t^3$ (0 to 105)	(84)
PBrCl ₂	$d_4^t = 2.9249 - 0.002477t + 0.0675t^2 - 0.0552t^3$ (0 to 100)	(61)
PSCl ₃	$d_4^t = 2.9249 - 0.002415t - 0.066t^2 + 0.08195t^3$ (100 to 175)	(61)
PBrCl ₂	$d_4^t = 2.9231 - 0.002458t + 0.06378t^2 - 0.08281t^3$ (0 to 158)	(84)
PSCl ₃	$d_4^t = 2.1207 - 0.002128t + 0.0688t^2 - 0.0857t^3$ (12 to 134)	(84)
PBrCl ₂	$d_4^t = 1.6682 - 0.001681t + 0.0648t^2 - 0.0848t^3$ (0 to 124)	(84)
13 AsF ₃	$d_4^t = 2.6659 - 0.003839t + 0.05435t^2$ (0 to 60)	(84)
AsCl ₃	$d_4^t = 2.2050 - 0.002159t - 0.07395t^2 - 0.09443t^3$ (-15 to 130)	(61)
AsBr ₃	$d_4^t = 2.2050 - 0.002186t + 0.06211t^2 - 0.08273t^3$ (0 to 129)	(84)
SbH ₃	$d_4^t = 3.4694 - 0.002948t + 0.05248t^2$ (50 to 100)	(32)
SbCl ₃	$d_4^{25} = 3.540$	(66)
SbBr ₃	$d_4^{-25} = 2.26; d_4^{-50} = 2.34$	(78)
BiCl ₃	$d_4^t = 2.8131 - 0.001636t - 0.0632t^2$ (75 to 150)	(40)
BiBr ₃	$d_4^{99.5} = 3.845$	(31)
CO	$d_4^{95} = 3.6926; d_4^{100} = 3.6807$	(39)
CS ₂	$d_4^t = 4.438 - 0.00229t$ (250 to 350)	(4, 32, 90)
COS	$d_4^t = 5.248 - 0.0026t$ (272 to 330)	(32)
CNCl	$d_4^t = -0.0052 - 0.0042t$ (-205 to -185)	(7)
18 SiO ₂	$d_4^t = 1.2931 - 0.001475t - 0.077t^2 - 0.07194t^3$ (-35 to 60)	(61)
SiH ₄	$d_4^t = 1.2922 - 0.001487t + 0.06217t^2 - 0.07182t^3$ (0 to 45)	(84)
	$d_4^t = 1.2918 - 0.00139t + 0.064t^2$ (-110 to 0)	(36)
	$d_4^t = 1.2927 - 0.00148t - 0.06306t^2$ (-111 to 0)	(76, 87)
	$d_4^t = 1.2931 - 0.001508t$ (0 to 45)	(6, 15, 20, 23, 27, 29, 30, 33, 47, 56, 61, 74, 75, 84, 86, 88, 92)
	$d_4^{186} = 1.539$	(30)
	$d_4^{87} = 1.24$	(79)
	$d_4^t = 1.222 - 0.0018t$ (0 to 45)	(50)
	For other C-compounds, v. p. 27	
	v. Vol. IV, p. 19	
	$d_4^{186} = 0.68$	(80)

B-TABLE.—(Continued)

Substance	$d_4^t = d_0 + at + bt^2 + \dots$ (range, °C)	Lit.
18 Si ₂ H ₆	$d_4^{25} = 0.686$	(80)
Si ₂ H ₆ O	$d_4^{80} = 0.881$	(81)
SiCl ₄	$d_4^t = 1.5237 - 0.001975t - 0.06714t^2 - 0.0749t^3$ (-32 to 59)	(61)
SiH ₂ Cl ₂	$d_4^t = 1.5241 - 0.002038t - 0.06408t^2 - 0.07149t^3$ (0 to 57)	(84)
SiH ₃ Cl	$d_4^{122} = 1.42$	(82)
SiBr ₄	$d_4^{113} = 1.145$	(82)
SiH ₃ Br	$d_4^t = 2.8128 - 0.00268t + 0.06445t^2 + 0.0964t^3$	(84)
Si ₃ H ₉ N	$d_4^{80} = 1.72$	(81)
	$d_4^{106} = 0.895$	(83)
TiCl ₄	$d_4^t = 1.7609 - 0.00166t - 0.0681t^2 + 0.08158t^3$ (-22 to 135)	(61)
GeH ₄	$d_4^t = 1.7604 - 0.001729t - 0.0654t^2 - 0.0578t^3$ (0 to 135)	(84)
Ge ₂ H ₆	$d_4^{142} = 1.523$	(13)
Ge ₃ H ₈	$d_4^{109} = 1.98$	(16)
22 SnCl ₂	$d_4^{106} = 2.20$	(16)
SnCl ₄	$d_4^t = 3.674 - 0.001253t$ (290 to 400)	(32)
	$d_4^t = 2.2671 - 0.00257t + 0.0673t^2 - 0.07111t^3$ (-19 to 113)	(61)
SnI ₄	$d_4^t = 2.2788 - 0.002643t + 0.06137t^2 - 0.0712t^3$ (0 to 113)	(84)
PbCl ₂	$d_4^t = 4.145 - 0.00245t$ (145 to 275)	(94)
PbBr ₂	$d_4^t = 5.627 - 0.00144t$ (522 to 740)	(45)
PbI ₂	$d_4^t = 6.175 - 0.00145t$ (600 to 800)	(45)
GaCl ₃	$d_4^{383} = 5.625$	(67)
TiNO ₃	$d_4^{80} = 2.36$	(42)
CdCl ₂	$d_4^t = 5.312 - 0.00195t$ (214 to 290)	(32)
HgCl ₂	$d_4^t = 3.731 - 0.03685t$ (600 to 800)	(45)
HgBr ₂	$d_4^{600} = 3.299$	(5)
HgI ₂	$d_4^t = 5.021 - 0.002218t$ (280 to 335)	(65)
32 AgCl	$d_4^t = 5.928 - 0.00338t$ (240 to 340)	(65)
AgClO ₃	$d_4^t = 6.060 - 0.00322t$ (255 to 355)	(65)
AgBr	$d_4^{200} = 5.287$	(67)
AgI	$d_4^t = 5.267 - 0.0392t$ (628 to 783)	(46)
AgNO ₃	$d_4^{461} = 4.919$	(67)
Fe(CO) ₅	$d_4^t = 4.2626 - 0.001742t$ (223 to 247)	(25)
Ni(CO) ₄	$d_4^t = 6.023 - 0.00103t$ (681 to 819)	(46)
CrO ₂ Cl ₂	$d_4^{427} = 5.595$	(67)
VOCl ₃	$d_4^t = 6.139 - 0.00101t$ (597 to 801)	(46)
	$d_4^{527} = 5.522$	(67)
	$d_4^t = 4.2070 - 0.001112t$ (239 to 410)	(25, 32, 67)
	$d_4^t = 1.4937 - 0.001853t$ (0 to 60)	(17)
	$d_4^{18} = 1.4644$	(54)
	$d_4^t = 1.3561 - 0.002213t - 0.034t^2$ (0 to 36)	(55)
	$d_4^t = 1.9586 - 0.001908t + 0.0516t^2 - 0.057t^3$ (-47 to 25)	(53)
	$d_4^t = 1.9610 - 0.001880t - 0.0633t^2 - 0.0777t^3$ (0 to 116)	(84)
	$d_4^t = 1.8653 - 0.0018t - 0.072t^2 - 0.0826t^3$ (0 to 125)	(43, 63, 68, 84)
	$d_4^t = 1.633 - 0.03125t$ (900 to 1100)	(2)
	$d_4^t = 1.8766 - 0.00245t + 0.0528564t^2$ (0 to 80)	(18)
	$d_4^{18} = 1.7955$	(11)
	$\frac{1}{t} \frac{dt}{dt} < 15 \times 10^{-6}$ (below 240°); $> 200 \times 10^{-6}$ (above 240°)	(70)
	$d_4^t = 1.85 - 0.0027t$ (200 to 230)	(9)
	$d_4^t = 2.87 - 0.0023t$ (100 to 225)	(9)
	$d_4^{99.5} = 2.754$	(31)
	$d_4^t = 3.70 - 0.0025t$ (200 to 240)	(9)
	$d_4^t = 2.37 - 0.034t$ (850 to 1000)	(2)
	$d_4^t = 3.11 - 0.0347t$ (850 to 1000)	(2)

B-TABLE.—(Continued)

Substance	$d_{4,t}^t = d_0 + at + bt^2 + \dots$ (range, °C)	Lit.
⁷⁹ BaCl ₂	$d_4^t = 3.72 - 0.036t$ (1000 to 1050)	(2)
LiF	$d_4^t = 2.201 - 0.03474t$ (887 to 1058)	(32)
LiCl	$d_4^t = 1.762 - 0.03432t$ (626 to 985)	(12, 32)
LiBr	$d_4^t = 2.93 - 0.037t$ (above 547)	(12)
Li ₂ SO ₄	$d_4^t = 2.346 - 0.03402t$ (853 to 1112)	(12, 32)
LiNO ₃	$d_4^t = 1.919 - 0.03547t$ (288 to 546)	(32)
	$d_4^t = 1.930 - 0.03549t$ (260 to 309)	(25)
Li ₂ CO ₃	$d_4^t = 2.071 - 0.0334t$ (800 to 1000)	(12)
⁸² NaOH	$d_4^t = 2.11 - 0.0363t$ (340 to 440)	(52)
NaF	$d_4^t = 2.506 - 0.03564t$ (1017 to 1214)	(32)
NaCl	$d_4^t = 1.959 - 0.0352t$ (809 to 1010)	(2, 12, 32, 45)
NaBr	$d_4^t = 2.927 - 0.03795t$ (785 to 954)	(12, 32)
NaI	$d_4^t = 3.441 - 0.001061t$ (675 to 724)	(32)
Na ₂ SO ₄	$d_4^t = 2.495 - 0.0348t$ (900 to 1046)	(12, 32)
NaNO ₃	$d_4^t = 2.114 - 0.0367t$ (320 to 550)	(32, 45)
	$d_4^t = 2.134 - 0.03702t$ (343 to 492)	(25)
NaPO ₃	$d_4^t = 2.545 - 0.0344t$ (905 to 1007)	(2, 32)
Na ₂ CO ₃	$d_4^t = 2.305 - 0.034t$ (893 to 1048)	(12)
Na ₂ MoO ₄	$d_4^t = 3.235 - 0.0363t$ (804 to 1063)	(12)
Na ₂ WO ₄	$d_4^t = 4.409 - 0.03795t$ (917 to 1330)	(12)
Na ₃ AlF ₆	$d_4^t = 0.708 + 0.00152t$ (972 to 995)	(59)
	$d_4^t = 3.543 - 0.00133t$ (995 to 1083)	(59)
⁸³ KOH	$d_4^t = 2.25 - 0.001t$ (380 to 440)	(52)
KF	$d_4^t = 2.477 - 0.03666t$ (913 to 1054)	(32)
KCl	$d_4^t = 1.971 - 0.0358t$ (785 to 958)	(2, 12, 32, 69)
Carnallite	$d_4^t = 1.945 - 0.0341t$ (570 to 780)	(3)
KBr	$d_4^t = 2.708 - 0.038t$ (751 to 945)	(12, 32, 45)
KI	$d_4^t = 3.159 - 0.00104t$ (700 to 751)	(32)
K ₂ SO ₄	$d_4^t = 2.472 - 0.03545t$ (1100 to 1300)	(32)
KNO ₃	$d_4^t = 2.097 - 0.0370t$ (352 to 564)	(25, 32, 45)
KPO ₃	$d_4^t = 2.455 - 0.0343t$ (988 to 1196)	(32)
K ₂ CO ₃	$d_4^t = 2.314 - 0.0346t$ (911 to 1036)	(12)
K ₂ Cr ₂ O ₇	$d_4^t = 2.564 - 0.03698t$ (420 to 497)	(32)
K ₂ MoO ₄	$d_4^t = 2.964 - 0.03644t$ (964 to 1324)	(32)
K ₂ WO ₄	$d_4^t = 3.871 - 0.0376t$ (991 to 1361)	(32)
⁸⁴ RbF	$d_4^t = 3.707 - 0.00101t$ (820 to 1006)	(12)
RbCl	$d_4^t = 2.701 - 0.000818t$ (734 to 822)	(12)
RbBr	$d_4^t = 3.460 - 0.0011t$ (697 to 780)	(12)
RbI	$d_4^t = 3.577 - 0.00111t$ (700 to 800)	(12)
Rb ₂ SO ₄	$d_4^t = 3.260 - 0.03665t$ (1101 to 1307)	(12)
RbNO ₃	$d_4^t = 2.782 - 0.0397t$ (348 to 555)	(12)
⁸⁵ CsF	$d_4^t = 3.611 - 0.00124t$ (720 to 824)	(32)
CsCl	$d_4^t = 3.489 - 0.00108t$ (661 to 741)	(32)
CsBr	$d_4^t = 3.997 - 0.001342t$ (662 to 743)	(32)
CsI	$d_4^t = 3.953 - 0.001215t$ (639 to 701)	(32)
Cs ₂ SO ₄	$d_4^t = 3.867 - 0.038t$ (1040 to 1220)	(32)
CsNO ₃	$d_4^t = 3.270 - 0.001115t$ (445 to 575)	(32)

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(For a key to the periodicals see end of volume)

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DENSITY AND SPECIFIC VOLUME OF WATER

V. STOTT AND PHILIP H. BIGG

1. DENSITY OF WATER IN G PER ML BETWEEN 0°C AND 40°C

The values given below are the means of those given by P. Chappuis, 238, 13: D 40; 07, and those of M. Thiessen, K. Scheel, and H. Diesselhorst, 89, 3: 68; 00. The last column gives the average differences, expressed in units in the seventh decimal place, of the values tabulated in the preceding columns from the values of which they are the mean.

DENSITY—WATER

25

°C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Diff. / 10
0	0.9998679	0.9998746	0.9998811	0.9998874	0.9998935	0.9998995	0.9999053	0.9999109	0.9999163	0.9999216	1
1	9267	9315	9363	9408	9452	9494	9534	9573	9610	9645	0
2	9679	9711	9741	9769	9796	9821	9844	9866	9887	9905	0
3	9922	9937	9951	9962	9973	9981	9988	9994	9998	*0000	0
4	1.0000000	*9999	*9996	*9992	*9986	*9979	*9970	*9960	*9947	*9934	0
5	0.9999919	0.9999902	0.9999883	0.9999864	0.9999842	0.9999819	0.9999795	0.9999769	0.9999741	0.9999712	1
6	9681	9649	9616	9581	9544	9506	9467	9426	9384	9340	1
7	9295	9248	9200	9150	9099	9046	8992	8936	8879	8821	2
8	8762	8701	8638	8574	8509	8442	8374	8305	8234	8162	3
9	8088	8013	7936	7859	7780	7699	7617	7534	7450	7364	5
10	7277	7189	7099	7008	6915	6820	6724	6627	6529	6428	6
11	6328	6225	6121	6017	5911	5803	5694	5585	5473	5361	2
12	5247	5132	5016	4898	4780	4660	4538	4415	4291	4166	0
13	4040	3913	3784	3655	3524	3391	3258	3123	2987	2850	1
14	2712	2572	2432	2290	2147	2003	1858	1711	1564	1415	1
15	1265	1113	0961	0808	0653	0497	0340	0182	0023	*9862	2
16	0.9989701	0.9989538	0.9989374	0.9989209	0.9989043	0.9988876	0.9988707	0.9988538	0.9988367	0.9988195	6
17	8022	7848	7673	7497	7319	7141	6961	6781	6599	6416	9
18	6232	6046	5861	5673	5485	5295	5105	4913	4720	4526	14
19	4331	4136	3938	3740	3541	3341	3140	2937	2733	2529	18
20	2323	2117	1909	1701	1490	1280	1068	0855	0641	0426	22
21	0210	*9993	*9775	*9556	*9335	*9114	*8892	*8669	*8444	*8219	25
22	0.9977993	0.9977765	0.9977537	0.9977308	0.9977077	0.9976846	0.9976613	0.9976380	0.9976145	0.9975910	27
23	5674	5437	5198	4959	4718	4477	4235	3991	3747	3502	29
24	3256	3009	2760	2511	2261	2010	1758	1505	1250	0995	30
25	0739	0482	0225	*9966	*9706	*9445	*9184	*8921	*8657	*8393	31
26	0.9968128	0.9967861	0.9967594	0.9967326	0.9967057	0.9966786	0.9966515	0.9966243	0.9965970	0.9965696	30
27	5421	5146	4869	4591	4313	4033	3753	3472	3190	2907	29
28	2623	2338	2052	1766	1478	1190	0901	0610	0319	0027	28
29	0.9959735	0.9959440	0.9959146	0.9958850	0.9958554	0.9958257	0.9957958	0.9957659	0.9957359	0.9957059	25
30	6756	6454	6151	5846	5541	5235	4928	4620	4312	4002	23
31	3692	3380	3068	2755	2442	2127	1812	1495	1178	0861	20
32	0542	0222	*9901	*9580	*9258	*8935	*8612	*8286	*7961	*7635	19
33	0.9947308	0.9946980	0.9946651	0.9946321	0.9945991	0.9945660	0.9945328	0.9944995	0.9944661	0.9944327	17
34	3991	3655	3319	2981	2643	2303	1963	1622	1280	0938	16
35	0594	0251	*9906	*9560	*9214	*8867	*8518	*8170	*7820	*7470	16
36	0.9937119	0.9936767	0.9936414	0.9936061	0.9935707	0.9935351	0.9934996	0.9934639	0.9934282	0.9933924	18
37	3565	3206	2846	2484	2123	1760	1397	1032	0668	0302	22
38	0.9929936	0.9929568	0.9929201	0.9928833	0.9928463	0.9928093	0.9927722	0.9927351	0.9926978	0.9926605	28
39	6232	5857	5482	5106	4730	4352	3974	3595	3216	2836	36
40	2455										42

2. VOLUME, IN ML, OF 1 G OF WATER BETWEEN 0°C AND 40°C
Computed from Table 1

°C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	1.0001322	1.0001255	1.0001190	1.0001127	1.0001065	1.0001005	1.0000948	1.0000892	1.0000837	1.0000785
1	0734	0685	0637	0592	0548	0506	0466	0427	0390	0355
2	0320	0289	0259	0230	0204	0179	0156	0134	0113	0095
3	0078	0063	0049	0038	0027	0019	0012	0006	0003	0000
4	0000	0001	0004	0008	0014	0022	0030	0040	0053	0067
5	0081	0098	0117	0137	0159	0182	0206	0232	0259	0288
6	0319	0351	0384	0419	0456	0494	0533	0574	0617	0661
7	0706	0753	0801	0851	0902	0954	1008	1064	1121	1179
8	1239	1300	1362	1426	1491	1558	1626	1696	1767	1839
9	1913	1988	2064	2142	2221	2302	2384	2467	2551	2637
10	2724	2813	2905	2993	3086	3181	3278	3374	3473	3573
11	3674	3776	3881	3985	4091	4199	4308	4417	4529	4641
12	4755	4871	4987	5105	5223	5343	5465	5588	5712	5837
13	5963	6091	6219	6349	6480	6613	6747	6882	7018	7155
14	7293	7433	7574	7716	7859	8003	8149	8296	8444	8592
15	8743	8895	9047	9201	9356	9512	9669	9828	9987	*0149
16	1.0010309	1.0010473	1.0010638	1.0010803	1.0010970	1.0011137	1.0011306	1.0011476	1.0011647	1.0011819
17	1993	2167	2343	2519	2697	2876	3056	3237	3419	3603
18	3787	3973	4160	4348	4537	4727	4918	5110	5303	5498

2. VOLUME, IN ML, OF 1 G OF WATER BETWEEN 0°C AND 40°C.—(Continued)

°C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
19	1.0015694	1.0015890	1.0016088	1.0016286	1.0016487	1.0016687	1.0016889	1.0017093	1.0017296	1.0017502
20	7708	7916	8124	8333	8544	8756	8968	9182	9397	9612
21	9830	*0048	*0266	*0486	*0708	*0930	*1153	*1377	*1603	*1828
22	1.0022056	1.0022285	1.0022514	1.0022744	1.0022976	1.0023208	1.0023442	1.0023676	1.0023912	1.0024148
23	4386	4624	4864	5104	5346	5589	5832	6077	6322	6569
24	6816	7065	7314	7565	7817	8069	8322	8577	8833	9089
25	9346	9605	9864	*0124	*0387	*0649	*0912	*1176	*1442	*1708
26	1.0031974	1.0032243	1.0032512	1.0032782	1.0033052	1.0033325	1.0033598	1.0033871	1.0034146	1.0034422
27	4699	4976	5255	5535	5815	6097	6379	6662	6947	7232
28	7517	7804	8093	8381	8671	8962	9253	9546	9839	*0134
29	1.0040428	1.0040725	1.0041022	1.0041320	1.0041619	1.0041918	1.0042219	1.0042521	1.0042824	1.0043127
30	3432	3736	4043	4350	4658	4966	5277	5587	5898	6211
31	6523	6838	7153	7469	7786	8104	8422	8741	9062	9382
32	9704	*0028	*0351	*0676	*1001	*1327	*1654	*1983	*2311	*2641
33	1.0052972	1.0053303	1.0053636	1.0053969	1.0054303	1.0054637	1.0054973	1.0055310	1.0055647	1.0055985
34	6324	6664	7005	7346	7688	8032	8376	8711	9067	9413
35	9761	*0109	*0457	*0807	*1158	*1510	*1862	*2215	*2570	*2924
36	1.0063279	1.0063636	1.0063993	1.0064351	1.0064710	1.0065070	1.0065430	1.0065791	1.0066153	1.0066516
37	6879	7244	7609	7975	8341	8709	9077	9447	9817	*0187
38	1.0070559	1.0070932	1.0071304	1.0071678	1.0072052	1.0072428	1.0072804	1.0073181	1.0073559	1.0073938
39	4317	4697	5077	5460	5841	6225	6609	6993	7379	7765
40	8152									

3. DENSITY OF WATER IN G PER ML BETWEEN 40°C AND 100°C

The values given are from M. Thiessen, 89, 4: 32; 18

°C	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
40	0.99224	0.99186	0.99147	0.99107	0.99066	0.99024	0.98982	0.98940	0.98896	0.98852
50	0.98807	0.98762	0.98715	0.98669	0.98621	0.98573	0.98525	0.98475	0.98425	0.98375
60	0.98324	0.98272	0.98220	0.98167	0.98113	0.98059	0.98005	0.97950	0.97894	0.97838
70	0.97781	0.97723	0.97666	0.97607	0.97548	0.97489	0.97429	0.97368	0.97307	0.97245
80	0.97183	0.97121	0.97057	0.96994	0.96930	0.96865	0.96800	0.96734	0.96668	0.96601
90	0.96534	0.96467	0.96399	0.96330	0.96261	0.96192	0.96122	0.96051	0.95981	0.95909
100	0.95838									

4. VOLUME, IN ML, OF 1 G OF WATER, BETWEEN 40°C AND 100°C

Computed from Table 3

°C	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
40	1.00782	1.00821	1.00861	1.00901	1.00943	1.00985	1.01028	1.01072	1.01116	1.01161
50	1.01207	1.01254	1.01301	1.01349	1.01398	1.01448	1.01498	1.01548	1.01600	1.01652
60	1.01705	1.01758	1.01813	1.01867	1.01923	1.01979	1.02036	1.02093	1.02154	1.02210
70	1.02270	1.02330	1.02390	1.02452	1.02513	1.02576	1.02639	1.02703	1.02768	1.02833
80	1.02899	1.02965	1.03032	1.03099	1.03168	1.03237	1.03306	1.03376	1.03447	1.03518
90	1.03590	1.03663	1.03736	1.03810	1.03884	1.03959	1.04035	1.04111	1.04188	1.04265
100	1.04343									

5. DENSITY AND SPECIFIC VOLUME OF WATER BELOW 0°C,
G/ML AND ML/G
J. F. Mohler, 1, 35: 236; 12

<i>t</i> , °C	Density	Volume
0	0.9999	1.0001
− 1	0.9998	1.0002
− 2	0.9997	1.0003
− 3	0.9996	1.0004
− 4	0.9994	1.0006
− 5	0.9992	1.0008
− 6	0.9990	1.0011
− 7	0.9987	1.0013

<i>t</i> , °C	Density	Volume
− 8	0.9985	1.0015
− 9	0.9982	1.0018
− 10	0.9979	1.0021
− 11	0.9976	1.0024
− 12	0.9973	1.0027
− 13	0.9969	1.0031

6. EFFECT OF DISSOLVED AIR ON THE DENSITY OF WATER

Between the temperatures 5°C and 8°C the density of water saturated with air was found to be 0.0000030 g/ml less than the density of air-free water (Chappuis, 238, 14: D 63; 10).

DENSITY AND THERMAL EXPANSION OF LIQUID ORGANIC COMPOUNDS UNDER ATMOSPHERIC PRESSURE

ROGER F. BRUNEL[†] AND KATHARINE VAN BIBBER

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C ₂ H ₅ OH, Ethyl alcohol.	C ₂ H ₅ OH, Alcool éthylique.	C ₂ H ₅ OH, Äthylalkohol.	C ₂ H ₅ OH, Alcool etilico.	27
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UNITS

d = density in g/ml = specific gravity $t/4$ (*in vacuo*). $t = ^\circ\text{C}$.

Methyl Alcohol

Klason and Norlin (¹¹⁹) give values for d_4^t as follows: 0° , 0.80999; 10° , 0.80069; 15° , 0.79601; 20° , 0.79134; 30° , 0.78184.

These values are checked by other investigators as follows: At 0° to 0.00001 by Young and Fortey (²⁸³), at 15° to 0.00001 by Gyr (⁸⁶) and Doroshevskii (⁴⁷); at 10° to 0.00004 and at 20° to 0.00001 by Loomis (¹³⁷). Values of Dittmar and Fawsitt (⁴²), Young (²⁸¹), Timmermans (²⁵²), and Tyrer (²⁵⁷) are higher, but do not agree with each other.

The following equation reproduces the above values to 0.00002:

$$d_4^t = 0.80999 - 0.039253t - 0.0641t^2.$$

Extrapolation by this equation to 60° gives values which are probably the best available. They run nearly parallel to those of Dittmar and Fawsitt (⁴²) but about 0.0003 lower.

Timmermans gives for the range -94.5° to $+15^\circ$:

$$d_4^t = 0.81015 - 0.0210041t - 0.061802t^2 - 0.071657t^3.$$

The value at 0° is probably in error, but the values for lower temperatures are the best available.

Ethyl Alcohol

Osborne, McKelvy, and Bearce (¹⁶⁶) give the following values for ethyl alcohol saturated with air, which supersede all earlier determinations: 10° , 0.79784; 15° , 0.79360; 20° , 0.78934; 25° , 0.78506; 30° , 0.78075; 35° , 0.77641; 40° , 0.77203.

$$d_4^t = 0.78506 - 0.038591(t - 25) - 0.0656(t - 25)^2 - 0.085(t - 25)^3.$$

These values are about 0.00004 lower than those of Winkler (²⁷⁵) and those of Klason and Norlin (¹¹⁹). See (¹⁶⁶) for an exhaustive review of earlier work.

Riiber (²²¹) has more recently determined the density at 20° as 0.789334 ± 0.000003 (d_4^{20} for water taken as 0.998232).

The following equation reproduces the above values to 0.0001, and then follows the results of Young (²⁸¹) up to 80° to 0.0002, although this degree of reliability at the higher temperatures cannot be claimed for it:

$$d_4^t = 0.80625 - 0.038461t + 0.06160t^2 - 0.085t^3.$$

Timmermans (²⁵³) gives the following equation for temperatures below 0° without specifying in the reference quoted the range for which it holds:

$$d_4^t = 0.80625 - 0.03845t + 0.0629t^2.$$

Young's value for d_4^0 is used.

DENSITY-TEMPERATURE EQUATIONS

Table 1 gives the parameters of the equation:

$$d_t = [d_s + 10^{-3} \alpha(t - t_s) + 10^{-6} \beta(t - t_s)^2 + 10^{-9} \gamma(t - t_s)^3] \pm 10^{-4} \Delta.$$

Except where indicated by giving t_s as a subscript in Column 3, $t_s = 0^\circ\text{C}$. Where the density at 0°C has not been determined, a value has in many cases been arrived at by extrapolation. Such values are enclosed in parentheses and are given as a basis for calculation only.

Except in the case of a few common compounds which are difficult to investigate or which have been investigated over an unusual temperature range, equations have not been calculated unless there are checks to establish their reliability. Such checks are either determinations by different investigators or determinations on duplicate specimens by the same investigator. Such checks are rarely available over a wide temperature range, but the extent of agreement at particular temperatures indicates at least the probable degree of purity of the material used. The probable limit of error indicated is based upon the degree of concordance of such checks. The values given by the equations are likely in many cases to be more nearly correct than indicated, in the neighborhood of room temperature, less reliable at more remote temperatures. It cannot be safely assumed that specimens of a substance differing even slightly in purity will give parallel density-temperature curves.

Except where the density-temperature curve is practically linear, the equations have been calculated by the method of least squares. Many of them are based upon a composite set of values from different sources where these fall upon a smooth curve. Equations quoted directly from the literature are indicated in the table.

The equations cannot be used with any degree of certainty for values outside of the temperature range upon which they are based.

Equations covering temperatures below the melting points of the substances refer to measurements upon undercooled liquids.

As regards the method of formulating the density-temperature relationship, it may be noted that Körber (121) and Timmermans (253) have shown the possibility of basing calculations on extrapolated values for the density at absolute zero. Albertosi (49) proposes the equation $d^3 = A - BT$, where T = absolute temperature.

TABLE 1.—DENSITY-TEMPERATURE EQUATIONS BASED ON RELIABLE DATA

Formula	Name	d_s	α	β	γ	Limit of error	Range, °C	Lit.	
								Data employed	Confirmatory
CCl ₂ O	Carbonyl chloride	1.435	-2.377	-0.7		0.005	-140 to +50	(4)	(66)
CCl ₄	Carbon tetrachloride	1.63255	-1.9110	-0.690		.0002¶	0 to 40	(13, 279)	(45, 59)
CHCl ₃	Chloroform	1.52643	-1.8563	-.5309	-8.81	.0001¶	-53 to +55	(250, 257)	
HCN	Hydrocyanic acid	0.7205	-1.45			.005	0 to 15	(255)	
CH ₂ O ₂ *	Formic acid	1.2441	-1.221	+ .126		.002	0 to 40	(77)	(191, 266)
CH ₃ I†	Methyl iodide	2.3343	-2.670	-1.77		.002	0 to 40	(44)	(172)
CH ₃ NO	Formamide	(1.1517)	-0.8405	+0.075		.001	0 to 75	(256)	(267)
CH ₃ NO ₂	Nitromethane	(1.1645)	-1.337	-1.15	+ 3.8	.001	0 to 100	(93)	(185, 264); cf. (274)
C ₂ Cl ₄	Tetrachloroethylene	(1.6475)	-1.62			.002	0 to 90	(96)	(229)
C ₂ H ₂ Br ₄	1, 1, 2, 2-Tetrabromoethane	(3.0087)	-2.230	-0.0889		.001	0 to 70	(269)	(172)
C ₂ H ₂ Cl ₂ O ₂	Dichloroacetic acid	(1.5919)	-1.375			.002	0 to 100	(103, 231)	(188)
C ₂ H ₂ Cl ₄ ‡	1, 1, 2, 2-Tetrachloroethane	1.5869 ²⁵	-1.530	-.78	+ 2.5	.001	25 to 90	(268)	(39, 285)
C ₂ H ₃ N	Acetonitrile	0.8035	-1.055	-.138	-6	.0001¶	-45 to +65	(56, 252, 266)	
C ₂ H ₄ Br ₂	Ethylene bromide	(2.2223)	-2.090	-.20		.001¶	0 to 30	(12, 254)	
C ₂ H ₄ Cl ₂	Ethylene chloride	1.28248	-1.4217	-.933	+ 2.29	.0002¶	0 to 74	(257)	(103, 250)
C ₂ H ₄ O	Ethylene oxide	0.8968	-1.348	-.32		.001	-50 to +20	(141)	(187)
C ₂ H ₄ O ₂ §	Acetic acid	(1.0724)	-1.1229	+ .0058	-2.0	.001¶	9 to 100	(257)	(163)
C ₂ H ₄ O ₂	Methyl formate	1.00319	-1.4174	-.776	-8.62	.0005¶	0 to 100	(285)	(183, 250)
C ₂ H ₅ Br||	Ethyl bromide**	1.50138	-2.0644	+ .2673		.003	-119 to +34	(253)	(182, 257)
C ₂ H ₅ I†	Ethyl iodide	1.98049	-2.217	-1.55	+ 3.0	.002	0 to 63	(257)	(44, 182, 189)
C ₂ H ₅ NO	Acetamide	0.9986 ⁸⁵	-0.81			.003	85 to 120	(256)	(14, 54)
C ₂ H ₆	Ethane	0.5612 ⁻¹⁰⁰	-1.307			.001	-108 to -74	(142)	(143)
C ₂ H ₅ N ₂ O	Dimethylnitrosamine	1.0242	-0.867	-1.83		.001	0 to 75	(256, 264)	
C ₂ H ₆ O ₂	Glycol	1.1257	-0.5713	-2.766	+10.9	.001	0 to 136	(232)	(61, 265)
C ₂ H ₆ S	Ethylmercaptan	0.8623	-1.077	-2.25		.001	0 to 80	(10)	(161, 259)
C ₂ H ₇ N	Ethylamine	0.7057	-1.112	-2.7		.0005¶	0 to 15	(185, 250)	
C ₃ H ₂ N ₂	Malonic nitrile	(1.0850)	-1.124	+2.66	-12.8	.001	33 to 107	(268)	(24)
C ₃ H ₄	Allylene	0.7062 ⁻⁵⁰	-1.245				-55 to -13	(143)	
C ₃ H ₅ ClO	α -Epichlorohydrin	1.2031	-1.218	-0.246		.002	0 to 115	(229, 247)	(103)
C ₃ H ₅ N	Propionitrile	0.80200**	-1.017	-.483			-90 to 0	(253)	
		0.8020	-0.991	-.553		.0005	0 to 100	(24, 56, 253, 266)	
C ₃ H ₅ NO	Lactonitrile	1.0048	-.8438	-.518		.002	0 to 60	(256, 264)	
C ₃ H ₆ O††	Acetone	0.81248**	-1.1142	-.315		.0002	-83 to +25	(252)	
		0.81248	-1.100	-.858		.001¶	0 to 50	(183, 239, 252)	
C ₃ H ₆ O ₂	Ethyl formate	0.94802	-1.2506	-1.063	-0.98	.001¶	0 to 100	(285)	(183)
C ₃ H ₆ O ₂	Methyl acetate	0.95932	-1.2710	-0.405	-6.09	.001	0 to 100	(285)	(218, 252)
C ₃ H ₇ I	<i>n</i> -Propyl iodide	1.7844	-1.845	-1.25		.0005¶	0 to 52	(61, 110, 204)	
C ₃ H ₇ I	Isopropyl iodide	1.7439	-1.948	-0.80		.001¶	0 to 25	(20, 183, 249)	
C ₃ H ₇ N	Allylamine	0.7838	-0.953	-6.2		.001	0 to 25	(185)	(24)
C ₃ H ₇ NO	Propionamide	0.9437 ¹⁰⁰	-.8135	-0.42		.005	80 to 120	(256)	(54)
C ₃ H ₈	Propane	0.6259 ⁻⁸⁰	-1.156	+ .15			-78 to -24	(143)	
C ₃ H ₈ O†††	<i>n</i> -Propyl alcohol	0.8201	-0.8183	+1.08	-16.5	.001¶	0 to 100	(274)	(25, 67, 183)
C ₃ H ₈ O	Isopropyl alcohol	0.8014	-.809	-0.27		.0005¶	0 to 25	(25, 46, 283)	(134)
C ₃ H ₈ O ₂ §§	Glycerol	1.2727	-.5506	-1.016	+ 1.270	.001	0 to 280	(80)	(100, 169)
C ₃ H ₉ N	<i>n</i> -Propylamine	(0.7344)	-.6133	-8.4		.001	0 to 45	(256)	(103)
C ₃ H ₄ N ₂	Succinonitrile	0.9880 ⁸⁰	-.80			.002	60 to 110	(93)	(24, 53, 61)
C ₃ H ₄ S	Thiophene	1.08717	-1.124	-0.93		.0005	0 to 50	(120)	(103)
C ₃ H ₇ N|||	<i>n</i> -Butyronitrile**	0.8092	-0.909	-.32		.002	0 to 98	(56)	(85, 89)
C ₃ H ₅ Cl ₂ S	Di-(2-chloroethyl) sulfide	(1.2950)	-1.058			.001	15 to 90	(273)	(89)
C ₃ H ₆ O	Methyl ethyl ketone	0.82551	-1.022	-.46		.0005¶	0 to 50	(145, 207, 250)	
C ₃ H ₆ O ₂	<i>n</i> -Butyric acid	(0.9780)	-0.9831	-.080		.001	25 to 81	(21, 61, 70, 149)	
C ₃ H ₆ O ₂	Isobutyric acid**	0.96820	-.9849	+1.036		.0005¶	-45 to +18	(252)	(61)
C ₃ H ₆ O ₂	Ethyl acetate**	0.92454	-1.168	-1.95	+20	.00005	0 to 40	(261)	
		0.92450	-1.1987	-0.3265		.0001¶	-83 to 0	(252)	
C ₃ H ₆ O ₂	Methyl propionate	0.93871	-1.1891	+ .419	-0.0106	.001	0 to 100	(285)	(64, 211)
C ₃ H ₆ O ₃	Methyl lactate	1.1160	-1.160			.0015	-75 to +125	(176)	(204)
C ₄ H ₁₀	<i>n</i> -Butane	0.601	-1.28	-.6		.005	-24 to +35	(127)	(222)
C ₄ H ₁₀ N ₂ O	Nitrosodiethylamine	0.9598	-0.874	-.39		.001	0 to 75	(256)	(24)
C ₄ H ₁₀ O	<i>n</i> -Butyl alcohol	0.82390	-.699	-.32		.0004¶	0 to 47	(3, 26, 214)	(218)
C ₄ H ₁₀ O	Isobutyl alcohol	0.8169	-.751	-.28	-8	.0005¶	0 to 50	(160)	(23, 48, 67)
C ₄ H ₁₀ O	Ether	0.73629**	-1.1044	-.4772		.0001	-120 to 0	(244)	(252)
		0.73629**	-1.1138	-1.237		.0001¶	0 to 70	(244)	(252)
C ₄ H ₁₀ O ₄ S	Diethyl sulfate	1.1717	-0.9936	-0.453		.002	0 to 75	(264, 268)	(30)
C ₄ H ₁₀ S	Diethyl sulfide	0.8563	-.9612	-.668		.001¶	0 to 99	(10)	(25, 161)
C ₄ H ₄ O ₂	Furfural	1.1808	-1.064	-.179		.0005¶	0 to 75	(22, 235, 264)	(144)
C ₄ H ₅ N	Pyridine	1.00304	-1.000	+ .355	-0.50	.0005¶	-45 to +18	(252)	(55, 286)
C ₄ H ₇ NO ₂	Ethyl cyanoacetate	1.0817	-1.022	+ .115		.002	0 to 70	(264, 268)	(24)

TABLE 1.—DENSITY-TEMPERATURE EQUATIONS BASED ON RELIABLE DATA.—(Continued)

Formula	Name	d_4	α	β	γ	Limit of error	Range, °C	Lit.	
								Data employed	Confirmatory
C ₅ H ₈ O ₂	Acetylacetone.....	0.9971	-1.005	+0.40		0.001	0 to 75	(103, 264)	(69)
C ₅ H ₈ O ₃	Levulinic acid.....	1.1564	-0.85			.002	0 to 75	(103)	(23, 186)
C ₆ H ₁₀ O	Diethyl ketone.....	0.8337	-.940	-.662		.001	0 to 53	(32, 61, 78, 233)	
C ₆ H ₁₀ O¶¶	Methyl propyl ketone.....	0.8261	-.923	-.766		.0005¶	0 to 54	(157)	(183, 248)
C ₆ H ₁₀ O ₂	Ethyl propionate.....	0.9124	-1.1223	+0.203	-7.31	.0005¶	0 to 100	(285)	(13, 146, 229)
C ₆ H ₁₀ O ₂	Methyl <i>n</i> -butyrate.....	0.92006	-1.0704	-.714	+1.19	.0002¶	0 to 100	(281)	(218)
C ₆ H ₁₀ O ₂	Methyl isobutyrate.....	0.91131	-1.0986	-.712	+0.37	.0002	0 to 100	(285)	(65)
C ₆ H ₁₀ O ₂	<i>n</i> -Propyl acetate.....	0.90835	-1.094	-0.438		.001	0 to 40	(13)	(211)
C ₆ H ₁₀ O ₃	Ethyl lactate.....	(1.0553)	-1.126			.0005	7 to 108	(277)	(101)
C ₆ H ₁₁ N	Piperidine.....	(0.9791)	-0.9258	+1.512	-22.5	.0005¶	0 to 80	(60, 131, 185)	
C ₆ H ₁₂	2-Methylbutane.....	0.63943**	-.9719	-0.408			-123 to +15	(252)	
		0.63930	-.9714	-.695	-7.08	.0003¶	-50 to +100	(252, 281)	
C ₆ H ₁₂	<i>n</i> -Pentane.....	0.64537**	-.9467	-.4495			-123 to +15	(252)	
		0.64539	-.9398	-.6243	-7.53	.0005¶	-53 to +100	(252, 281)	
C ₆ H ₅ Br***	Bromobenzene.....	1.52231	-1.345	-.24	+0.76	.0005¶	0 to 80	(13)	(250, 278)
C ₆ H ₅ Cl†††	Chlorobenzene.....	1.12782	-1.0664	-.2463	-.53	.0005¶	0 to 73	(257)	(13, 278)
		1.12795**	-1.0606	+ .717			-45 to 0	(252)	
C ₆ H ₅ F	Fluorobenzene.....	1.0466	-1.164	-1.074	+5.28	.001¶	0 to 90	(150, 278)	(189)
C ₆ H ₅ I†††	Iodobenzene.....	1.86059	-1.4814	-0.4234		.001¶	0 to 150	(278)	(177, 189)
C ₆ H ₅ NO ₂	Nitrobenzene.....	(1.22300)	-0.98721	-.09944		.0002¶	0 to 58	(257)	(133, 189, 250)
C ₆ H ₆	Benzene.....	(0.90005)	-1.0636	-.0376	-2.213	.0002¶	11 to 72	(13, 281)	
C ₆ H ₆ O	Phenol.....	(1.0920)	-0.8188	-.670		.001	40 to 150	(18, 155, 189)	
C ₆ H ₇ N	Aniline.....	1.03893	-.86534	+ .0929	-1.90	.0002¶	0 to 99	(257)	(29, 233, 246, 252)
C ₆ H ₁₀ O	Cyclohexanone.....	(0.9625)	-.852			.001	8 to 92	(95)	(6, 219)
C ₆ H ₁₀ O ₃	Ethyl acetoacetate.....	(1.0456)	-.9540	-.7351		.0005¶	17 to 74	(233)	(189, 245)
C ₆ H ₁₀ O ₄	Glycol diacetate.....	(1.1266)	-1.13						
C ₆ H ₁₀ O ₄	Diethyl oxalate.....	(1.1017)	-1.145	-.416		.0005¶	13 to 95	(233)	(53, 183)
C ₆ H ₁₀ O ₄ §§§	Dimethyl <i>d</i> -tartrate.....	1.2925 ⁶⁰	-1.044			.002	60 to 135	(151)	(170, 171, 202)
C ₆ H ₁₂	Cyclohexane.....	0.79707	-0.8879	-.972	+1.55	.0003¶	0 to 65	(79)	(6, 219)
C ₆ H ₁₂ O	Cyclohexanol.....	(0.9627)	-.7587			.0005¶	16 to 90	(95)	(219)
C ₆ H ₁₂ O ₂	Isobutyl acetate.....	0.89200	-1.036	-.313		.0003¶	0 to 40	(13)	(64, 65, 218)
C ₆ H ₁₂ O ₂	<i>sec</i> -Butyl acetate.....	(0.8905)	-0.9024	-2.1		.002	15 to 85	(165)	(38, 198)
C ₆ H ₁₂ O ₂	Ethyl <i>n</i> -butyrate.....	0.8997	-1.031	-0.46		.0003¶	0 to 69	(13)	(65, 70, 130)
C ₆ H ₁₂ O ₂	Ethyl isobutyrate.....	0.89060	-1.055	-.500		.0005	0 to 40	(13)	(65); cf. (218)
C ₆ H ₁₄	Diisopropyl.....	0.67948	-0.8763	-.5010	-4.59	.0001¶	0 to 100	(281)	(34)
C ₆ H ₁₄	<i>n</i> -Hexane.....	0.6769	-.8486	-1.084	+0.164	.0001¶	0 to 100	(281)	(251)
C ₆ H ₁₅ N	Di- <i>n</i> -propylamine.....	(0.7553)	-.826	-0.74		.001	0 to 60	(256)	(185)
C ₇ H ₅ N	Benzonitrile.....	1.02279	-.8758	-.14		.001¶	0 to 60	(189, 250, 256, 266)	
C ₇ H ₆ O	Benzaldehyde.....	1.0620	-.875	-.117		.002	0 to 100	(189)	(122)
C ₇ H ₇ Br	<i>p</i> -Bromotoluene.....	(1.4313)	-1.25			.0005¶	30 to 100	(158, 189)	
C ₇ H ₇ NO ₂	<i>m</i> -Nitrotoluene.....	(1.1765)	-0.937			.001	17 to 100	(172)	(228)
C ₇ H ₈	Toluene.....	0.88448**	-.9159	+ .368			-95 to +18	(252)	
		0.88412	-.92248	+ .0152	-4.223	.0005¶	0 to 99	(257)	(13, 217, 252)
C ₇ H ₈ O	Benzyl alcohol.....	(1.0609)	-.7683	-.459		.001	0 to 100	(189)	(218, 266)
C ₇ H ₈ O	<i>o</i> -Cresol.....	1.0654	-.84	-.43		.0005¶	0 to 150	(16)	(19, 218)
C ₇ H ₈ O	<i>m</i> -Cresol.....	(1.0495)	-.7639	-.471		.0003¶	9 to 153	(16, 265)	(189, 218)
C ₇ H ₈ O	<i>p</i> -Cresol.....	1.0487	-.75	-.3		.0005¶	0 to 100	(19)	(189)
C ₇ H ₉ N	Benzylamine.....	(0.9981)	-.8207	-.432		.001¶	0 to 100	(189)	(256)
C ₇ H ₉ N	Methylaniline.....	1.0027**	-.803	-.242		.0005¶	0 to 158	(57)	(189)
C ₇ H ₉ N	<i>o</i> -Toluidine.....	1.0149**	-.833	-.04		.0005¶	11 to 158	(57)	(189)
C ₇ H ₉ N	<i>p</i> -Toluidine.....	0.9702 ⁴⁰	-.8340	-.410		.001	40 to 175	(18)	(57, 128)
C ₇ H ₁₂ O	<i>o</i> -Methylcyclohexanone.....	(0.9424)**	-.8640			.001	15 to 90	(95)	(6)
C ₇ H ₁₂ O	<i>p</i> -Methylcyclohexanone.....	(0.9312)**	-.8028			.001	17 to 90	(95)	(6)
C ₇ H ₁₂ O ₄	Diethyl malonate.....	1.07593	-.9948	-.705		.001	0 to 100	(272)	(53, 183)
C ₇ H ₁₄ O	<i>o</i> -Hexahydrocresol.....	(0.9459)**	-.8590			.001	39 to 90	(95)	(6, 225)
C ₇ H ₁₄ O ₂	Heptylic acid.....	(0.9323)	-.7474	-1.017		.001	0 to 80	(52)	(61, 139)
C ₇ H ₁₄ O ₂	Ethyl isovalerate.....	0.88540	-.9815	-0.313		.0005	0 to 40	(13)	(65)
C ₇ H ₁₄ O ₂	<i>d</i> - <i>sec</i> -Butyl propionate.....	(0.8883)	-1.070	+ .07		.002	17 to 125	(198)	(165)
C ₇ H ₁₆	<i>n</i> -Heptane.....	0.70048	-0.8476	+ .1880	-5.23	.0002¶	0 to 100	(281)	(35, 247)
C ₈ H ₇ N	Benzyl cyanide.....	1.0325	-.794	-.37		.001	0 to 50	(189, 266)	(51, 256)
C ₈ H ₈ O	Acetophenone.....	1.0267 ^{21.6**}	-.8467	-.596		.0002¶	21 to 114	(56)	(189)
C ₈ H ₉ NO	Acetanilide.....	1.0261 ¹²⁰	-.820			.003	120 to 160	(256)	(83)
C ₈ H ₁₀	<i>m</i> -Xylene.....	0.88151	-.8515	-.109	-1.73	.0005¶	0 to 100	(257)	(189, 218)
C ₈ H ₁₀ O	Phenetole.....	0.9852	-.9224			.001¶	0 to 80	(18)	(85, 112)
C ₈ H ₁₁ N	Dimethylaniline.....	0.9726	-.8140	-.216		.001¶	0 to 177	(19, 57)	(126, 152, 189, 246)
C ₈ H ₁₄ O ₆	Diethyl malate.....	(1.1480)	-.9227	-.804		.001	20 to 60	(154, 263)	
C ₈ H ₁₄ O ₆	Diethyl <i>d</i> -tartrate.....	1.2254	-1.007			.0005	-23 to +160	(169, 170)	(100)
C ₈ H ₁₄ O ₆	Dimethyl dimethoxysuccinate.....	1.1305 ⁶⁰	-1.052			.02	60 to 153	(179)	(209)
C ₈ H ₁₆ O ₂	<i>d</i> - <i>sec</i> -Butyl butyrate.....	(0.8861)	-0.877	-1.09		.001	13 to 126	(198)	(262)
C ₈ H ₁₈	<i>n</i> -Octane.....	0.71848	-.8239	+0.4459	-5.293	.001	0 to 130	(281, 284)	(35, 36)
C ₉ H ₇ N	Quinoline|||.....	1.1090	-.7542	-1.265	-0.80	.001¶	0 to 200	(16, 140)	(189, 208)
C ₉ H ₁₀ O ₂	Ethyl benzoate.....	(1.0651)	-.9046	-.2423		.001¶	4 to 69	(126, 130)	(189, 213)
C ₉ H ₁₂	<i>n</i> -Propylbenzene.....	0.8780	-.8115	-.366		.0003¶	0 to 160	(61, 189, 219, 229)	

TABLE 1.—DENSITY-TEMPERATURE EQUATIONS BASED ON RELIABLE DATA.—(Continued)

Formula	Name	d_4	α	β	γ	Limit of error	Range, °C	Lit.	
								Data employed	Confirmatory
C ₉ H ₁₂	Pseudocumene.....	(0.8923)	-0.8036	-0.170		0.0003	10 to 95	(189)	(13, 23)
C ₉ H ₁₃ N	Dimethyl- <i>o</i> -toluidine.....	0.9447**	-.828	-.33		.0005	0 to 151	(57)	(189)
C ₉ H ₂₀	<i>n</i> -Nonane.....	0.7333	-.75	-.455		.0005¶	0 to 99	(123)	(37)
C ₉ H ₂₁ N	Tri- <i>n</i> -propylamine.....	0.7730	-.7660	-.45		.001	0 to 75	(103, 256)	
C ₁₀ H ₈	Naphthalene.....	0.9779 ⁸⁰	-.7670	-.755		.001¶	82 to 177	(57, 128, 228)	(2)
C ₁₀ H ₁₄	Cymene¶¶¶	0.8734**	-.785	-.275		.001¶	0 to 83	(138)	(22, 189)
C ₁₀ H ₁₄ N ₂	Nicotine.....	(1.02385)	-.7041	-.964		.001¶	20 to 98	(105)	(206)
C ₁₀ H ₁₄ O	3-Methyl-2-hydroxyisopropylbenzene..	(0.9894)	-.7741	-.224		.001	25 to 70	(164)	(61, 189)
C ₁₀ H ₁₅ N	Diethylaniline.....	0.9508	-.785	-.259		.001	0 to 158	(50, 57, 189)	
C ₁₀ H ₁₆	<i>d</i> -Pinene****	0.8624 ²⁰	-.83			.002	20 to 93	(151)	(1)
C ₁₀ H ₁₅ O ₆	Dipropyl <i>d</i> -tartrate.....	(1.1563)	-.9391	-.245		.001	15 to 167	(173)	(94, 170)
C ₁₀ H ₂₀ O	<i>l</i> - α -Menthhol.....	0.8840 ¹⁰	-.765			.001	40 to 80	(181, 190)	
C ₁₀ H ₂₂	<i>n</i> -Decane.....	0.7455	-.7293	-.371		.0005	0 to 100	(123)	
C ₁₀ H ₂₂	2, 6-Dimethyloctane.....	0.73880	-.7302	-.515		.0005¶	0 to 80	(63, 133)	(64, 69)
C ₁₁ H ₁₂ O ₂	<i>trans</i> -Ethyl cinnamate.....	(1.0667)	-.861			.001	10 to 100	(189)	(103)
C ₁₁ H ₂₄	<i>n</i> -Undecane.....	0.7563	-.745	-.05		.001	0 to 100	(123)	(223)
C ₁₃ H ₁₀ O	α -Benzophenone.....	1.0800 ⁵⁷	-.790	-.12		.001	25 to 100	(57)	(14, 103, 189)
C ₁₃ H ₂₈	<i>n</i> -Tridecane.....	0.7716	-.704	-.072		.0005¶	0 to 99	(123)	
C ₁₄ H ₁₈ N	Dibenzylamine.....	(1.0428)	-.753	-.35		.002	20 to 75	(256)	(189)
C ₁₄ H ₃₀	<i>n</i> -Tetradecane.....	(0.7787)	-.69	-.13		.001	0 to 99	(123)	(124)
C ₁₅ H ₃₂	<i>n</i> -Pentadecane.....	(0.7832)	-.70	-.025		.0005¶	10 to 99	(123)	
C ₁₆ H ₃₄	<i>n</i> -Hexadecane.....	(0.7879)	-.688			.0005¶	18 to 99	(123)	
C ₁₇ H ₃₆	<i>n</i> -Heptadecane.....	(0.7913)	-.639	-.29		.0005¶	22 to 100	(123)	
C ₁₈ H ₃₈	<i>n</i> -Octadecane.....	(0.7757 ³⁰)	-.7024	+ .395		.0005¶	28 to 99	(123)	
C ₂₀ H ₄₂	<i>n</i> -Eicosane.....	0.7827 ³⁰	-.666			.0005¶	36 to 99	(123)	

* *v.* (68, 191, 266) for values not agreeing with this equation, but probably less reliable.

† The values recorded in the literature for methyl and ethyl iodides are particularly discordant.

‡ De Pauw (41) gives d_4^{25} 1.5891 for material purified with particular care.

§ The equation given, based on the values of Tyrer, although reproducing his values and those of Nasini and Bresciani (163) with an error in most cases less than 0.0001, is apparently based on values determined with impure acid. The acid of the latter authors melted at 16.1°. Bousfield and Lowry (17) obtained with very pure acid a M. P. of 16.60 \pm 0.005° and a density at 18° and 20°, 0.0007 lower than the values given by the equation. These values are probably correct. The following equation:

$$D_t = (1.0695) - 0.0210092t - 0.06339t^2 - 0.08574t^3$$

based on the values of Ramsay and Young (210) gives a value at 20° very close to that of Bousfield and Lowry, but their values do not fall on a smooth curve, and their value at 13.11° determined by pycnometer does not fall on the curve given by the above equation. Subtraction of 0.0007 from the values given by the equation in the above table should be nearly correct in the interval 15-30°.

¶ Tyrer (257) gives values for 0-31° running nearly parallel to those of Timmermans, but 0.003 lower. The values of the latter may be, however, more accurate than is indicated above.

¶ See Table 3 for accurate values for the density at particular temperatures.

** Equation quoted from the literature cited.

†† The wide divergence in values given for acetone is probably due to the

failure of many investigators to realize the difficulty in drying it; *v.* (25, 252). The two equations given agree and are probably correct to 0.0002 from 0° to 25°.

‡‡ Young's values were used in calculating the equation, but the value of d_4^0 was so altered that the equation gives a value at 25° which is probably more reliable than Young's. This is a questionable procedure, but the equation is probably at least as accurate as indicated.

§§ The equation is based on the values of Gerlach since these are the only ones covering a wide temperature range. Data to be found in (109, 169) may be more reliable over narrower temperature ranges.

||| The data in the confirming references in the table would indicate an accuracy of at least 0.0005 for this equation, but widely divergent values (256) are also to be found.

¶¶ This equation gives a value for 101.7° differing by only 0.0014 from that given by the specific volume equation of Thorpe and Jones (248).

*** Equation accurate to 0.0002 for 0° to 40°.

††† Equation accurate to 0.0001 for 0° to 40°.

‡‡‡ The values of Meyer and Mylius (150) run nearly parallel to those given by the equation, but 0.0005 to 0.001 lower.

§§§ The density of dimethyl racemate runs uniformly about 0.001 lower than that of the *d*-tartrate (151).

|||| The accuracy of this equation at temperatures up to 40° is probably considerably greater than indicated in the table.

¶¶¶ Values of Bolle and Guye (16) lie about 0.0015 below the equation and run up to 150°.

**** Densities and expansion of *d*-, *l*- and *dl*-pinenes are nearly the same (151). The values of these investigators are higher than those of most others.

Table 2 gives references to data covering a considerable temperature range for which there are either no checks or checks which are not in agreement. The first reference usually indicates the data covering the widest temperature range. Subsequent references refer either to further similar data or to checks at particular temperatures, but no complete list of such checks is attempted. The checks are in all cases unsatisfactory.

Following the table is a list of papers giving additional data for large classes of substances, of which only the simpler representatives have been included in the table.

TABLE 2.—DENSITY-TEMPERATURE EQUATIONS OF UNKNOWN RELIABILITY

Formula	Name	Range, °C	Lit.
CHBrCl ₂	Bromodichloromethane.....	25 to 70	(269, 102)
CH ₃ Cl	Methyl chloride.....	-40 to +40	(238, 260)
CH ₃ S	Methylmercaptan.....	0 to 78	(10)
C ₂ HBr ₃ O	Bromal.....	25 to 100	(58)
C ₂ HCl ₃	Trichloroethylene.....	17 to 75	(96, 258)
C ₂ HCl ₃ O	Chloral.....	25 to 85	(58, 184, 247)
C ₂ HCl ₃ O ₂	Trichloroacetic acid.....	75 to 125	(103, 188)
C ₂ HCl ₅	Pentachloroethane.....	15 to 90	(96, 247)
C ₂ H ₂	Acetylene.....	-82 to -55	(142, 143, 148)
C ₂ H ₂ Cl ₂	<i>cis</i> -1, 2-Acetylene dichloride.....	15 to 45	(97, 15)
C ₂ H ₂ Cl ₂	<i>trans</i> -1, 2-Acetylene dichloride...	15 to 45	(97, 15)
C ₂ H ₃ Br ₃ O ₂	Bromal hydrate.....	40 to 100	(58)
C ₂ H ₃ ClO ₂	Chloroacetic acid.....	40 to 125	(83, 103, 158)
C ₂ H ₄	Ethylene.....	-114 to -69	(142, 143)
C ₂ H ₄ O	Acetaldehyde.....	0 to 50	(141)
C ₂ H ₅ BrO	2-Bromoethyl alcohol.....	0 to 30	(212)
C ₂ H ₅ BrO	Bromomethyl methyl ether.....	0 to 20	(110)
C ₂ H ₅ ClO	2-Chloroethyl alcohol.....	0 to 20	(110)

TABLE 2.—DENSITY-TEMPERATURE EQUATIONS OF UNKNOWN RELIABILITY.—(Continued)

Formula	Name	Range, °C	Lit.	Formula	Name	Range, °C	Lit.
C_2H_5ClO	Chloromethyl methyl ether	0 to 20	(110)	$C_6H_6N_2O_2$	<i>m</i> -Nitroaniline	120 to 160	(103)
C_2H_6O	Methyl ether	-41 to +12	(141)	C_6H_6S	Thiophenol	25 to 75	(268)
$C_2H_5O_4S$	Methyl sulfate	16 to 83	(241)	$C_6H_7ClO_4$	Methyl chloromaleate	25 to 75	(268)
C_2H_6S	Methyl sulfide	0 to 60	(10, 248)	$C_6H_7ClO_4$	Methyl chlorofumarate	25 to 75	(268)
$C_3H_5Br_2O_2$	1, 2-Dibromopropionic acid	50 to 90	(158)	$C_6H_8N_2$	Phenylhydrazine	20 to 60	(256)
C_3H_6	Propylene	-78 to +19	(143)	$C_6H_8O_4$	Dimethyl fumarate	106 to 160	(243)
$C_3H_6Br_2$	1, 2-Dibromopropane	25 to 81	(61)	$C_6H_8O_4$	Dimethyl maleate	20 to 135	(243)
C_3H_6O	Allyl alcohol	-120 to +20	(121, 3)	$C_6H_8O_6$	Glyceryl triformate	50 to 100	(103)
$C_3H_6O_2$	Propionic acid	15 to 96	(188, 149)	$C_6H_{10}O$	Mesityl oxide	5 to 90	(81, 90, 91)
$C_3H_7Br^*$	<i>n</i> -Propyl bromide	0 to 20	(110)	$C_6H_{10}O_4$	Dimethyl succinate	25 to 75	(103, 183)
$C_3H_7ClO_2$	3-Chloro-1, 2-dihydroxypropane	25 to 70	(268)	$C_6H_{10}O_4$	Glycol diacetate	14 to 74	(233)
$C_3H_7NO_2$	Lactamide	80 to 120	(257)	$C_6H_{10}O_4$	Methyl <i>l</i> -1-acetoxypropionate	-7 to +141	(176)
$C_3H_7NO_2$	Urethane	60 to 153	(256, 84)	$C_6H_{11}N$	Capronitrile	24 to 75	(103)
C_3H_8O	Methylethyl ether	0 to 51	(10)	$C_6H_{11}N$	Isobutylacetoneitrile	20 to 60	(256)
C_4H_5NS	Allyl isothiocyanate	25 to 80	(130)	$C_6H_{12}O_2$	Caproic acid	25 to 90	(52, 135)
$C_4H_6Cl_2O_2$	Methyl 1, 2-dichloropropionate	12 to 68	(75)	$C_6H_{12}O_3$	Paraldehyde	15 to 75	(72, 233)
$C_4H_6O_3$	Acetic anhydride	0 to 77	(50, 71)	$C_6H_{12}O_3$	<i>n</i> -Propyl lactate	2 to 122	(204)
$C_4H_7NO_2$	2-Aminocrotonic acid	11 to 57	(158)	C_6H_{14}	2-Methylpentane (isohexane)	0 to 40	(13, 34)
$C_4H_8O_2$	<i>n</i> -Propyl formate	0 to 100	(281, 13)	$C_6H_{14}O$	<i>l</i> -Ethylpropyl carbinol	13 to 104	(197)
$C_4H_9Br^*$	<i>n</i> -Butyl bromide	0 to 20	(110, 136)	$C_6H_{14}O$	<i>d</i> -Ethylisopropyl carbinol	18 to 63	(195)
$C_4H_9NO_2$	Methyl urethane	56 to 99	(228)	$C_6H_{14}O$	<i>d</i> -Methylbutyl carbinol	17 to 133	(194)
$C_4H_9NO_2$	Butyl nitrite	11 to 45	(241)	$C_6H_{14}O$	<i>d</i> -Pinacolyl alcohol	16 to 99	(199)
$C_4H_{10}O^*$	<i>d</i> -sec.-Butyl alcohol	16 to 76	(194)	$C_6H_{15}N$	<i>n</i> -Hexylamine	0 to 40	(103)
$C_4H_{10}O_3S$	Diethyl sulfite	25 to 80	(268)	$C_6H_{15}N$	2-Hexylamine	0 to 50	(103)
$C_4H_{10}O_4$	<i>dl</i> -Erythritol	69 to 143	(83)	$C_6H_{15}N$	Triethylamine	0 to 50	(103)
$C_4H_{10}O_4S$	Diethyl sulfate	12 to 67	(241)	$C_6H_{15}O_4P$	Triethyl phosphate	15 to 83	(241)
$C_4H_{11}N$	<i>n</i> -Butylamine	0 to 40	(103, 159)	$C_6H_{16}Si$	Dimethyldiethylsilicane	0 to 91	(28)
$C_4H_{11}N$	Isobutylamine	0 to 50	(103, 185)	$C_6H_{16}Si$	Trimethylpropylsilicane	0 to 85	(28)
$C_4H_{11}N$	<i>tert</i> -Butylamine	0 to 50	(103)	$C_6H_{18}Si_2$	Hexamethylsilicoethane	12 to 94	(28)
$C_4H_5Cl_2O_2$	Ethyl 1, 2-dichloropropionate	16 to 57	(75)	C_7H_5NO	Phenyl isocyanate	0 to 50	(31)
$C_4H_5O_2$	2, 2-Dimethylacrylic acid	24 to 154	(81)	C_7H_5NS	Phenyl thiocyanate	25 to 50	(131)
C_4H_9N	<i>n</i> -Valeronitrile	10 to 50	(153)	C_7H_7Br	<i>o</i> -Bromotoluene	4 to 75	(103, 189)
C_4H_9NS	Isobutyl isothiocyanate	11 to 109	(16)	C_7H_7I	<i>p</i> -Iodotoluene	40 to 164	(240)
$C_5H_{10}O_2$	<i>n</i> -Valeric acid	20 to 70	(52)	C_7H_7NO	Benzamide	130 to 170	(256)
$C_5H_{10}O_2$	Isovaleric acid	18 to 61	(236)	C_7H_7NO	Formanilide	60 to 105	(256, 189)
$C_5H_{10}O_2$	<i>d</i> -sec.-Butyl formate	21 to 94	(200)	$C_7H_7NO_2$	<i>o</i> -Hydroxybenzamide	140 to 170	(256)
$C_5H_{10}O_2$	Isobutyl formate	0 to 40	(13)	$C_7H_7NO_2$	<i>o</i> -Nitrotoluene	16 to 101	(172, 242)
$C_5H_{10}O_3$	Ethyl carbonate	13 to 57	(241)	$C_7H_7NO_2$	<i>m</i> -Nitrotoluene	20 to 121	(242)
$C_5H_{10}O_3$	Methyl <i>l</i> -1-methoxypropionate	-16 to +130	(176)	$C_7H_7NO_2$	<i>p</i> -Nitrotoluene	55 to 125	(103, 189, 230)
$C_5H_{10}O_4$	Glycerol acetate	10 to 70	(153, 268)	$C_7H_7NO_3$	<i>p</i> -Nitroanisole	75 to 125	(103)
$C_5H_{11}NO$	Methylpropylketoxime	16 to 109	(16)	$C_7H_8N_2O$	Nitrosomethylaniline	20 to 90	(256, 103)
$C_5H_{11}NO_2$	Isoamyl nitrite	13 to 75	(241)	$C_7H_8N_2O_2$	<i>p</i> -Nitromethylaniline	160 to 200	(103)
$C_5H_{12}O^*$	<i>d</i> -sec.-Amyl alcohol	12 to 61	(194)	$C_7H_8N_2O_2$	3-Nitro- <i>o</i> -toluidine	100 to 140	(103)
$C_5H_{12}O$	<i>tert</i> -Amyl alcohol	25 to 80	(58)	$C_7H_8N_2O_2$	5-Nitro- <i>o</i> -toluidine	140 to 180	(103)
$C_5H_{12}O$	<i>d</i> -Methyl isopropyl carbinol	15 to 71	(198, 195)	$C_7H_8N_2O_2$	3-Nitro- <i>p</i> -toluidine	120 to 160	(103)
$C_5H_{12}O$	Ethyl propyl ether	0 to 78	(10, 43)	$C_7H_{10}O_4$	Dimethyl citraconate	26 to 78	(243)
$C_5H_{13}N$	<i>n</i> -Amylamine	0 to 50	(103)	$C_7H_{10}O_4$	Dimethyl mesaconate	20 to 80	(243)
$C_5H_{13}N$	Isoamylamine	0 to 60	(103, 256)	$C_7H_{12}Cl_2O_2$	Isobutyl 1, 2-dichloropropionate	16 to 65	(75)
$C_5H_{13}N$	<i>tert</i> -Amylamine	0 to 30	(103)	$C_7H_{12}O$	<i>m</i> -Methyleyclohexanone	17 to 90	(95, 6, 225)
$C_5H_{14}Si$	Trimethyl ethyl silicane	0 to 60	(28)	$C_7H_{14}O$	<i>m</i> -Hexahydrocresol	39 to 90	(95, 6, 225)
$C_6H_3ClN_2O_4$	α -4-Chloro-1, 3-dinitrobenzene	75 to 125	(103)	$C_7H_{14}O$	<i>p</i> -Hexahydrocresol	39 to 90	(95, 6)
$C_6H_3Cl_2NO_2$	2, 4-Dichloronitrobenzene	75 to 125	(103, 99)	$C_7H_{14}O_2$	<i>d</i> - β -Amyl acetate	18 to 91	(198)
$C_6H_3Cl_2NO_2$	2, 5-Dichloronitrobenzene	75 to 125	(103, 99)	$C_7H_{14}O_2$	Isoamyl acetate	14 to 109	(101)
$C_6H_3Cl_2NO_2$	3, 4-Dichloronitrobenzene	75 to 125	(103, 99)	$C_7H_{16}O$	<i>d</i> -Ethylbutyl carbinol	13 to 127	(197)
$C_6H_3Cl_3O$	2, 4, 6-Trichlorophenol	75 to 125	(103)	$C_7H_{16}O$	<i>d</i> -Methylamyl carbinol	20 to 64	(194)
C_6H_4BrCl	<i>p</i> -Bromochlorobenzene	71 to 155	(240)	$C_7H_{16}O$	<i>d</i> -Propylisopropyl carbinol	17 to 74	(195)
$C_6H_4BrNO_2$	<i>o</i> -Bromonitrobenzene	53 to 125	(103, 242)	$C_7H_{16}Si$	Dimethylcyclopentamethylene-silicane	0 to 80	(28, 27)
$C_6H_4BrNO_2$	<i>m</i> -Bromonitrobenzene	24 to 125	(83, 103, 242)	$C_7H_{17}N$	<i>n</i> -Heptylamine	0 to 40	(103)
$C_6H_4BrNO_2$	<i>p</i> -Bromonitrobenzene	133 to 164	(242)	$C_7H_{18}Si$	Dimethylethylpropylsilicane	0 to 81	(28)
$C_6H_4Br_2$	<i>p</i> -Dibromobenzene	100 to 140	(103)	$C_7H_{18}Si$	Trimethylbutylsilicane	0 to 85	(28)
C_6H_4ClI	<i>p</i> -Chloriodobenzene	57 to 151	(240)	$C_7H_{18}Si$	Trimethylisobutylsilicane	0 to 49	(28)
$C_6H_4ClNO_2$	<i>o</i> -Chloronitrobenzene	45 to 125	(103, 242)	$C_8H_4Cl_2O_2$	<i>o</i> -Phthalyl dichloride	33 to 181	(167)
$C_6H_4ClNO_2$	<i>m</i> -Chloronitrobenzene	25 to 125	(83, 103, 242)	C_8H_7N	<i>o</i> -Tolunitrile	20 to 95	(256, 189, 242)
$C_6H_4ClNO_2$	<i>p</i> -Chloronitrobenzene	85 to 135	(103)	C_8H_7N	<i>m</i> -Tolunitrile	18 to 80	(256, 242)
$C_6H_4Cl_2$	<i>p</i> -Dichlorobenzene	63 to 161	(103, 107)	C_8H_7N	<i>p</i> -Tolunitrile	30 to 176	(57, 189, 242, 256)
$C_6H_4FNO_2$	<i>m</i> -Fluoronitrobenzene	25 to 75	(103, 9)	C_8H_7NO	Mandelonitrile	20 to 60	(256)
$C_6H_4FNO_2$	<i>p</i> -Fluoronitrobenzene	30 to 75	(103, 9)	$C_8H_8N_2O_6$	4, 5-Dinitro-1, 2-dimethoxybenzene	140 to 180	(103)
$C_6H_4INO_2$	<i>o</i> -Iodonitrobenzene	75 to 125	(103)	$C_8H_8O_2$	<i>p</i> -Methoxybenzaldehyde	25 to 75	(103, 189)
$C_6H_4INO_2$	<i>m</i> -Iodonitrobenzene	50 to 100	(103)	$C_8H_8O_2$	Phenylacetic acid	77 to 130	(53, 230)
$C_6H_4N_2O_4$	<i>o</i> -Dinitrobenzene	120 to 160	(103)	C_8H_9NO	Phenylacetamide	160 to 180	(256)
$C_6H_4N_2O_4$	<i>m</i> -Dinitrobenzene	120 to 160	(103)	C_8H_9NO	Benzantialdoxime, <i>O</i> -methyl ether	14 to 72	(241)
$C_6H_4N_2O_6$	2, 4-Dinitrophenol	72 to 138	(83)	C_8H_9NO	Benzantialdoxime, <i>N</i> -methyl ether	103 to 151	(241)
C_6H_5ClO	<i>o</i> -Chlorophenol	10 to 150	(19)	$C_8H_9NO_3$	<i>p</i> -Nitrophenetole	75 to 125	(103)
$C_6H_5NO_2^*$	Nitrobenzene	ca. 210	(106)	$C_8H_{10}^+$	Ethylbenzene	0 to 40	(13, 189, 215, 220, 271)
$C_6H_5NO_3$	<i>o</i> -Nitrophenol	40 to 80	(19)				
$C_6H_5NO_3$	<i>m</i> -Nitrophenol	100 to 150	(103)				
$C_6H_5NO_3$	<i>p</i> -Nitrophenol	120 to 160	(103)				
$C_6H_5N_3$	Triazobenzene	0 to 50	(31, 189)				
C_6H_6ClN	<i>p</i> -Chloroaniline	77 to 159	(240)				

TABLE 2.—DENSITY-TEMPERATURE EQUATIONS OF UNKNOWN RELIABILITY.—(Continued)

Formula	Name	Range, °C	Lit.	Formula	Name	Range, °C	Lit.
C ₈ H ₁₀ O	<i>d</i> -Methylphenyl carbinol	13 to 80	(194)	C ₁₂ H ₂₂ O ₂	<i>l</i> -Menthyl acetate	17 to 132	(117)
C ₈ H ₁₀ O ₂	<i>o</i> -Dimethoxybenzene	25 to 75	(103, 61, 189)	C ₁₂ H ₂₂ O ₆	Di- <i>n</i> -butyl <i>d</i> -tartrate	18 to 170	(74)
C ₈ H ₁₁ ClO ₄	Ethyl chloromaleate	25 to 70	(268)	C ₁₂ H ₂₂ O ₆	Diisobutyl <i>d</i> -tartrate	75 to 98	(173)
C ₈ H ₁₁ N	<i>n</i> -Ethylaniline	0 to 158	(57, 189)	C ₁₂ H ₂₂ O ₆	Diisobutyl <i>l</i> -tartrate	98 to 146	(173)
C ₈ H ₁₃ BrO ₄	Diethyl bromoisosuccinate	25 to 75	(103)	C ₁₂ H ₂₂ O ₁₁||	Saccharose	-15 to +115	(234)
C ₈ H ₁₄	<i>n</i> -Hexylacetylene	25 to 70	(269)	C ₁₂ H ₂₄ O ₂	Lauric acid	50 to 90	(52, 61)
C ₈ H ₁₆ O ₂	<i>d</i> -β-Amyl propionate	18 to 96	(198)	C ₁₂ H ₂₆	<i>n</i> -Dodecane	0 to 99	(123)
C ₈ H ₁₆ O ₂	<i>d</i> -β-Hexyl acetate	18 to 125	(198)	C ₁₂ H ₂₇ N	Triisobutylamine	0 to 50	(103)
C ₈ H ₁₇ Br	<i>l</i> -2-Bromooctane	14 to 53	(194)	C ₁₃ H ₆ Cl ₆	2, 4, 2', 4'-Tetrachlorobenzophen- one chloride	145 to 185	(103)
C ₈ H ₁₈	2, 5-Dimethylhexane	0 to 276.8	(281, 282)	C ₁₃ H ₁₀ O ₃	Phenyl carbonate	87 to 145	(241)
C ₈ H ₁₈ O	<i>d</i> -Methyl- <i>n</i> -hexyl carbinol	25 to 46	(194)	C ₁₃ H ₁₂	Diphenylmethane	54 to 210	(57)
C ₈ H ₂₀ Si	Trimethylisoamylsilicane	0 to 81	(28)	C ₁₃ H ₁₃ N	<i>N</i> -Methyldiphenylamine	10 to 80	(18)
C ₈ H ₂₀ Si	Dimethylethylisobutylsilicane	0 to 80	(28)	C ₁₃ H ₁₄ O ₂	Isobutyl phenylpropionate	25 to 75	(268)
C ₈ H ₂₀ Si	Dimethyldi- <i>n</i> -propylsilicane	0 to 48	(28)	C ₁₃ H ₁₆ O	Benzalpinacolin	60 to 200	(81)
C ₈ H ₂₀ Si*	Tetraethylsilicane	0 to 91	(28)	C ₁₃ H ₂₀	Triethylphenylmethane	0 to 75	(27)
C ₉ H ₁₀ OS	Ethyl thiobenzoate	0 to 15	(213)	C ₁₃ H ₂₄ O ₄	Di- <i>l</i> -amyl malonate	25 to 75	(268)
C ₉ H ₁₀ S ₂	Ethyl dithiobenzoate	0 to 25	(213)	C ₁₄ H ₁₀ O ₂	Benzil	40 to 137	(83)
C ₉ H ₁₁ NO	<i>N</i> -Methylacetanilide	105 to 145	(256)	C ₁₄ H ₁₂ O ₂ *	Benzyl benzoate	5 to 100	(11, 111)
C ₉ H ₁₁ NO ₂	<i>N</i> -Phenylurethane	60 to 105	(256)	C ₁₄ H ₁₄	Dibenzyl	76 to 210	(57)
C ₉ H ₁₂ †	Mesitylene	4 to 95	(189, 57, 219)	C ₁₄ H ₁₄ N ₂ O	<i>o</i> -Azoxytoluene	74 to 139	(241)
C ₉ H ₁₂ O	<i>l</i> -Ethylphenyl carbinol	14 to 70	(199)	C ₁₄ H ₂₀ O ₂	<i>l</i> -Amyl hydrocinnamate	20 to 75	(268)
C ₉ H ₁₄ O ₆	Glycerol triacetate	25 to 75	(103)	C ₁₄ H ₂₃ ClO ₄	Di- <i>l</i> -amyl chlorofumarate	25 to 75	(268)
C ₉ H ₁₄ Si	Trimethylphenylsilicane	0 to 66	(28)	C ₁₄ H ₂₃ N	Diisobutylaniline	25 to 75	(103)
C ₉ H ₁₇ BrO ₂	<i>l</i> -Amyl bromobutyrate	25 to 90	(269)	C ₁₄ H ₂₄ O ₄	Di- <i>l</i> -amyl maleate	25 to 75	(268)
C ₉ H ₁₈ O ₂	Pelargonic acid	20 to 50	(52)	C ₁₄ H ₂₆ O ₄	Di- <i>l</i> -amyl succinate	25 to 70	(268)
C ₉ H ₁₈ O ₂	<i>d</i> -β-Amyl <i>n</i> -butyrate	18 to 96	(198)	C ₁₄ H ₂₆ O ₄	Diethyl sebacate	25 to 90	(269)
C ₉ H ₁₈ O ₂	<i>d</i> -sec.-Butyl valerate	13 to 128	(198)	C ₁₄ H ₂₆ O ₆	Diamyl malate	30 to 60	(154)
C ₉ H ₁₈ O ₂	<i>d</i> -β-Octyl formate	12 to 134	(200)	C ₁₄ H ₂₆ O ₆	Diisoamyl tartrate	14 to 175	(173)
C ₉ H ₂₂ Si	Triethyl- <i>n</i> -propylsilicane	0 to 67	(28)	C ₁₅ H ₂₆ O ₄	Di- <i>l</i> -amyl citraconate	25 to 75	(268)
C ₁₀ H ₉ BrO ₂	Methyl α (β)-bromocinnamate	20 to 135	(243)	C ₁₅ H ₂₆ O ₄	Di- <i>l</i> -amyl mesaconate	25 to 75	(268)
C ₁₀ H ₉ BrO ₂	Methyl α (β)-bromoallocinnamate	20 to 95	(243)	C ₁₅ H ₃₃ N	Triisoamylamine	20 to 75	(256)
C ₁₀ H ₁₀ O	Benzylideneacetone	60 to 200	(81, 82, 189)	C ₁₆ H ₁₆ NO ₂	Anisaldazine	173 to 225	(103)
C ₁₀ H ₁₀ O ₂	Methyl cinnamate	36 to 90	(243)	C ₁₆ H ₂₀ O ₇	Diethyl phenylacetyl- <i>d</i> -tartrate	36 to 93	(147)
C ₁₀ H ₁₀ O ₂	Methyl allocinnamate	20 to 80	(243)	C ₁₆ H ₂₂ Cl ₄ O ₈	Diisobutyl di-(dichloroacetyl) tar- trate	18 to 157	(175)
C ₁₀ H ₁₂ O	<i>p</i> -Anethole	11 to 99	(163, 228)	C ₁₆ H ₂₆ O ₈	Diisobutyl diacetyl- <i>d</i> -tartrate	14 to 202	(174)
C ₁₀ H ₁₂ O	<i>d</i> -1, 2, 3, 4-Tetrahydro-β- naphthol	61 to 155	(196)	C ₁₆ H ₃₀ O ₆	Di- <i>l</i> -amyl <i>d</i> -dimethoxysuccinate	15 to 99	(179)
C ₁₀ H ₁₂ O ₂	<i>d</i> -Methylbenzylcarbinyl formate	22 to 152	(200)	C ₁₆ H ₃₂ O ₂	Palmitic acid	60 to 80 (?)	(224)
C ₁₀ H ₁₃ NO	<i>N</i> -Ethylacetanilide	60 to 105	(256)	C ₁₆ H ₃₃ I	<i>n</i> -Cetyl iodide	18 to 138	(61)
C ₁₀ H ₁₄	Trimethylphenylmethane	0 to 90	(27)	C ₁₇ H ₂₂ O	<i>d</i> -α-Naphthyl- <i>n</i> -hexyl carbinol	31 to 146	(116)
C ₁₀ H ₁₄ O	<i>d</i> -Benzylethyl carbinol	0 to 142	(199)	C ₁₇ H ₃₄ O ₂	Margaric acid	60 to 80	(224)
C ₁₀ H ₁₄ O	Methyl <i>d</i> -methylbenzylcarbinyl ether	27 to 132	(192)	C ₁₈ H ₁₅ As	Triphenylarsine	48 to 82	(168)
C ₁₀ H ₁₄ O	<i>l</i> -Methylphenylethyl carbinol	0 to 136	(199)	C ₁₈ H ₁₅ O ₄ P	Triphenyl phosphate	58 to 89	(241)
C ₁₀ H ₁₄ O ₆	Diallyl tartrate	15 to 168	(173)	C ₁₈ H ₁₅ P	Triphenylphosphine	50 to 100	(168, 268)
C ₁₀ H ₁₆	<i>d</i> -(<i>l</i> , <i>dl</i>)-Limonene	10 to 90	(151)	C ₁₈ H ₁₅ Sb	Triphenylstibine	25 to 100	(168, 268)
C ₁₀ H ₁₆ O ₇	Diethyl monoacetyl- <i>d</i> -tartrate	20 to 71	(147)	C ₁₈ H ₁₈ O ₆	Dibenzyl tartrate	15 to 170	(173)
C ₁₀ H ₁₆ Si	Dimethylethylphenylsilicane	0 to 67	(28)	C ₁₈ H ₂₆ O ₄	Di- <i>l</i> -amyl phthalate	25 to 75	(268)
C ₁₀ H ₁₆ Si	Trimethylbenzylsilicane	0 to 90	(28)	C ₁₈ H ₃₄ O ₆	Di- <i>n</i> -heptyl tartrate	41 to 131	(74)
C ₁₀ H ₁₈ Cl ₂ O ₂	Heptyl 1, 2-dichloropropionate	13 to 79	(75)	C ₁₈ H ₃₆ O ₂	Stearic acid	60 to 80 (?)	(224)
C ₁₀ H ₁₈ O	<i>l</i> -Isopulegol	18 to 172	(193)	C ₁₉ H ₄₀	<i>n</i> -Nondecane	32 to 99	(155)
C ₁₀ H ₁₈ O ₆	Di-sec.-propyl tartrate	14 to 150	(173)	C ₂₀ H ₁₆ Br ₂ O ₈ ¶	Dimethyl di- <i>o</i> -bromobenzoyltar- trate	15 to 93	(73)
C ₁₀ H ₂₀ O	<i>l</i> -Neomenthol	0 to 30	(201)	C ₂₀ H ₁₆ Cl ₂ O ₈ ¶	Dimethyl di- <i>o</i> -chlorobenzoyltar- trate	15 to 140	(73)
C ₁₀ H ₂₀ O ₂	<i>d</i> -γ-Nonyl formate	20 to 154	(200)	C ₂₀ H ₁₆ I ₂ O ₈ ¶	Dimethyl di- <i>o</i> -iodobenzoyltar- trate	15 to 140	(73)
C ₁₀ H ₂₃ N	Diisoamylamine	0 to 50	(103)	C ₂₀ H ₃₈ O ₄	Diisoamyl sebacate	25 to 90	(269)
C ₁₀ H ₂₄ Si	Triethylbutylsilicane	0 to 89	(28)	C ₂₀ H ₃₈ O ₆	Di- <i>n</i> -octyl <i>d</i> -tartrate	54 to 135	(74)
C ₁₀ H ₂₄ Si	Triethylisobutylsilicane	0 to 70	(28)	C ₂₀ H ₃₈ O ₆ **	Di-β- <i>n</i> -octyl <i>d</i> -tartrate	36 to 100	(173)
C ₁₁ H ₁₀ O ₂	Ethyl phenylpropionate	25 to 75	(268)	C ₂₁ H ₂₁ N	Tribenzylamine	95 to 135	(266)
C ₁₁ H ₁₂ N ₂ O	Antipyrine	66 to 140	(83)	C ₂₁ H ₂₃ NO ₃	Ethyl 1-methyl- <i>p</i> -ethoxybenzal- aminocinnamate	95 to 160	(103)
C ₁₁ H ₁₂ O	Benzylidenemethyl ethyl ketone	18 to 200	(81, 5, 82)	C ₂₁ H ₂₈ O ₆	Tricaprin	50 to 100	(103)
C ₁₁ H ₁₄ O ₂	<i>d</i> -β-Butyl benzoate	18 to 128	(118)	C ₂₁ H ₄₄	Heneicosane	40 to 99	(123, 62)
C ₁₁ H ₁₆	Pentamethylbenzene	75 to 197	(57)	C ₂₂ H ₄₂ O ₃	Isobutyl ricinoleate	25 to 75	(267)
C ₁₁ H ₁₆	Trimethylbenzylmethane	0 to 92	(27)	C ₂₂ H ₄₆	<i>n</i> -Docosane	44 to 99	(123)
C ₁₁ H ₂₀	Nonylacetylene	20 to 70	(269)	C ₂₄ H ₂₆ O ₈	Diethyl diphenacetyl- <i>d</i> -tartrate	15 to 98	(147)
C ₁₁ H ₂₆ Si	Triethylisoamylsilicane	0 to 79	(28)	C ₂₆ H ₃₀ O ₈	Diisobutyl dibenzoyl- <i>d</i> -tartrate	17 to 100	(178)
C ₁₂ H ₁₀ N ₂ O	Azoxybenzene	44 to 92	(241)	C ₂₆ H ₅₄	<i>n</i> -Hexacosane	91 to 158	(227)
C ₁₂ H ₁₀ O ₅	Diphenyl ether	30 to 100	(49)	C ₂₇ H ₅₀ O ₆	Tricaprylin	50 to 100	(103)
C ₁₂ H ₁₁ N	Diphenylamine	60 to 125	(18, 103, 256)	C ₂₈ H ₆₂ O	Melissyl alcohol	95 to 158	(227)
C ₁₂ H ₁₂ Cl ₆ O ₈	Diethyl di-(trichloroacetyl) tar- trate	15 to 131	(175)	C ₃₂ H ₆₄ O ₂	Cetyl palmitate	50 to 65	(265)
C ₁₂ H ₁₂ O	<i>l</i> -Methyl-α-naphthyl carbinol	14 to 138	(199)	C ₃₃ H ₆₂ O ₆	Tricaprin	50 to 100	(103)
C ₁₂ H ₁₆ O ₂	Isopropyl hydrocinnamate	25 to 75	(268)	C ₃₅ H ₇₄ O ₆	Trilaurin	75 to 125	(103)
C ₁₂ H ₁₈	<i>l</i> -Methyl-3- <i>tert</i> -amylbenzene	-20 to +100	(33)	C ₅₁ H ₉₈ O ₆	Tripalmitin	75 to 125	(103, 226, 267)
C ₁₂ H ₁₈ O ₄	Triethyl aconitate	25 to 90	(269)	C ₅₇ H ₁₀₄ O ₆	Triolein	50 to 100	(103)
C ₁₂ H ₁₈ O ₈	Diethyl diacetyl tartrate	67 to 180	(228, 147)	C ₅₇ H ₁₁₀ O ₆	Tristearin	75 to 125	(103, 226, 267)
C ₁₂ H ₂₀ O ₂	Isopulegyl acetate	16 to 132	(193)	C ₆₀ H ₁₂₂	Hexacontane	115 to 190	(227)
C ₁₂ H ₂₀ Si	Triethylphenylsilicane	0 to 81	(28)				
C ₁₂ H ₂₁ ClO ₂	Menthyl chloroacetate	38 to 95	(72)				

* See Table 3 for accurate values for the density at particular temperatures.

† As may be seen in the articles referred to, there appear to be two sets of values for ethylbenzene differing by about 0.006.

‡ The values in the two references given check each other well, but most values recorded are lower.

$$\S \frac{10^6 \Delta V}{V \Delta t} (30 \text{ to } 100^\circ) = 800.$$

|| Densities of the undercooled liquid dissolved in paraffin.

¶ Densities of the *m*- and *p*-chloro-, bromo-, and iodo-derivatives over approximately the same temperature ranges are also given by these authors.

** Pickard and Kenyon (194) give densities at 17° for esters of *d*- β -*n*-octanol with *d*-, *l*-, and *dl*-tartaric acids.

DENSITY-TEMPERATURE DATA FOR VARIOUS COMPLEX COMPOUNDS

The following articles contain density determinations over a considerable range of temperature for large numbers of compounds, only part of which, usually the simpler ones, have been listed in Table 2.

Bygden (27). Thirty-one alkyl and aryl substituted silicanes over varying temperature ranges. Where the range exceeds 50°, they have been listed in the table.

Hall (87). Esters of *d*- β -octanol with dibasic acids from oxalic to undecanedicarboxylic, and a few mixed esters with one methyl or ethyl radical.

Hall (88). Esters of *l*-menthol with dibasic acids from malonic to decanedicarboxylic.

Kenyon (113). Esters of *d*- γ -nonanol, acetate to dodecoate, myristate, palmitate, stearate; acetates of active γ -carbinols, hexanol to octadecanol.

Kenyon and Pickard (115). Esters of *d*-methylbenzyl carbinol, acetate to dodecoate, myristate, palmitate, stearate. Esters of *d*-*n*-hexyl- α -naphthyl carbinol, acetate to undecoate (116). Esters of menthol with acetic, oxalic, phenylacetic, and substituted benzoic acids (117). Esters of various active alcohols with benzoic and α - and β -naphthoic acids (118).

Kenyon and McNicol (114). Ethers of *d*- β -octanol with *n*-alkyl radicals, methyl to nonyl.

Phillips (192). Ethers of *d*-methylbenzyl carbinol with *n*-alkyl radicals, methyl to nonyl.

Pickard and Kenyon (194). Alcohols $\text{CH}_3\text{CHOH.R}$, R representing *n*-alkyl radicals from ethyl to undecyl, together with some esters and halides. Alcohols, $(\text{CH}_3)_2\text{CH.CHOH.R}$, R representing *n*-alkyl radicals, methyl to octyl and decyl (195). Six aliphatic esters of 1-*ac*-tetrahydro-2-naphthol (196). Alcohols, $\text{CH}_3\text{CH}_2\text{CHOH.R}$, R representing *n*-alkyl radicals, propyl to tridecyl and pentadecyl (197). Many esters of active β -*n*-alkyl alcohols with acids from acetic to stearic, but not complete series (198).

Pickard, Hunter, Lewcock, and de Pennington (193). Esters of *l*-isopulegol with fatty acids, acetate to dodecoate and myristate.

Wood, Such, and Scarf (277). Esters of *l*-lactic acid with *n*-primary alcohols, methyl to nonyl.

TABLE 3.—ACCURATE VALUES FOR DENSITIES OF LIQUID ORGANIC COMPOUNDS AT PARTICULAR TEMPERATURES

This table gives densities at particular temperatures which have a probable error of 0.0005 or less. The probable limit of error is based upon the concordance of check determinations as in Table 1. The checking values must in some cases be obtained by interpolation. In the case of some substances, values which have been determined with particular care are included, although not confirmed by other investigators. No limit of error is indicated in such cases.

Table 3 cannot lay claim to any degree of completeness. It contains values which have been found in the course of work upon the temperature coefficients. The complete list would, however, probably not be a long one.

Formula	Name	d_4^t	$10^4 \Delta$	Lit.
CCl_4	Carbon tetrachloride	1.6326 ⁹	1	(13, 250)
		1.5941 ¹⁰	2	(13, 45)
CHCl_3	Chloroform	1.5264 ⁹	2	(250, 257)
$\text{C}_2\text{H}_5\text{N}$	Acetonitrile	0.7770 ²⁵	1	(56, 252, 266)
$\text{C}_2\text{H}_4\text{Br}_2$	Ethylene bromide	2.1805 ²⁰	2	(12, 254)
$\text{C}_2\text{H}_4\text{Cl}_2$	1, 1-Dichloroethane	1.1676 ²⁵	5*	(182, 183)
$\text{C}_2\text{H}_4\text{Cl}_2$	Ethylene chloride	1.28243 ⁹	2	(250, 257)
$\text{C}_2\text{H}_4\text{O}_2$	Acetic acid	1.04925 ²⁰	1	(17)
$\text{C}_2\text{H}_4\text{O}_2$	Methyl formate	1.0032 ²⁰	2	(250, 289)
$\text{C}_2\text{H}_5\text{BrO}$	Bromomethyl methyl ether	1.5976 ²⁰		(110)
$\text{C}_2\text{H}_5\text{IO}$	Iodomethyl methyl ether	2.0302 ²⁰		(110)
$\text{C}_2\text{H}_7\text{N}$	Ethylamine	0.7057 ⁰	5	(185, 250)
$\text{C}_3\text{H}_6\text{O}$	Acetone	0.7958 ¹⁶	2	(183, 252)
		0.7844 ²⁵	2	(183, 252)
$\text{C}_3\text{H}_6\text{O}_2$	Ethyl formate	0.9161 ²⁵	5	(183, 285)
$\text{C}_3\text{H}_7\text{Br}$	<i>n</i> -Propyl bromide	1.3626 ¹⁵	3	(110, 189)
$\text{C}_3\text{H}_7\text{I}$	<i>n</i> -Propyl iodide	1.7471 ²⁰		(110)
$\text{C}_3\text{H}_7\text{I}$	Isopropyl iodide	1.7149 ¹⁵	5	(20, 183)
$\text{C}_3\text{H}_8\text{O}$	<i>n</i> -Propyl alcohol	0.8001 ²⁵	1	(25, 67, 183)
$\text{C}_3\text{H}_8\text{O}$	Isopropyl alcohol	0.7810 ²⁵	2	(25)
$\text{C}_3\text{H}_8\text{O}_3$	Glycerol	1.2641 ¹⁵	3	(100, 109)
$\text{C}_4\text{H}_8\text{Br}_2$	1, 2-Dibromo-2-methylpropane	1.7730 ¹⁵		(132)
$\text{C}_4\text{H}_8\text{O}$	Methylethyl ketone	0.82551 ⁹		(250)
$\text{C}_4\text{H}_8\text{O}_2$	Isobutyric acid	0.9482 ²⁰	5	(61, 252)
$\text{C}_4\text{H}_8\text{O}_2$	Ethyl acetate	0.92454 ⁹	0.5†	(252, 261)
		0.90056 ¹⁰	0.5	(261)
		0.89446 ²⁵	0.5	(261)
$\text{C}_4\text{H}_9\text{Br}$	<i>n</i> -Butyl bromide	1.3035 ⁹	3	(110, 136)
$\text{C}_4\text{H}_{10}\text{O}$	<i>n</i> -Butyl alcohol	0.8097 ²⁰	3	(108, 214, 218, 287)
		0.8059 ²⁵	2	(26)
$\text{C}_4\text{H}_{10}\text{O}$	Isobutyl alcohol	0.7979 ²⁵	1	(25)
$\text{C}_4\text{H}_{10}\text{O}$	<i>sec</i> -Butyl alcohol	0.80254 ²⁵	1	(25)
$\text{C}_4\text{H}_{10}\text{O}$	Ether	0.73628 ⁹	0.1	(244, 252, 280)
		0.71930 ¹⁵	0.5	(244, 252)
		0.71352 ²⁰	0.5	(244, 280)
		0.70767 ²⁵	0.5	(244)
$\text{C}_4\text{H}_{10}\text{S}$	Ethyl sulfide	0.8370 ²⁰	4	(10, 25, 56)
$\text{C}_4\text{H}_{11}\text{N}$	Diethylamine	0.7000 ²⁵	5	(136, 185)
$\text{C}_5\text{H}_4\text{O}_2$	Furfural	1.1594 ²⁰	5	(22, 144, 235)
		1.1543 ²⁵	5	(144, 235, 264)
$\text{C}_5\text{H}_6\text{N}$	Pyridine	1.00304 ⁹		(252)
		0.9781 ²⁵	2†	(252, 286)
$\text{C}_5\text{H}_{10}\text{O}$	Methyl propyl ketone	0.8261 ⁹	3	(32, 157, 248)
$\text{C}_5\text{H}_{10}\text{O}_2$	Ethyl propionate	0.9125 ⁹	2	(252, 284, 285)
$\text{C}_5\text{H}_{10}\text{O}_2$	Methyl <i>n</i> -butyrate	0.8983 ²⁰	5	(218, 281)
$\text{C}_5\text{H}_{11}\text{N}$	Piperidine	0.8565 ²⁵	3	(131, 185)
C_5H_{12}	2-Methylbutane	0.63936 ⁹	1	(252, 281)
C_5H_{12}	<i>n</i> -Pentane	0.64538 ⁹		(252, 281)
$\text{C}_5\text{H}_{12}\text{O}$	<i>sec</i> -Amyl alcohol	0.8050 ²⁵		(25)
$\text{C}_6\text{H}_6\text{Br}$	Bromobenzene	1.52193 ⁹	1	(250, 278)
$\text{C}_6\text{H}_6\text{Cl}$	Chlorobenzene	1.1063 ²⁰	1	(13, 257, 278)
$\text{C}_6\text{H}_6\text{F}$	Fluorobenzene	1.0226 ²⁰	3	(150, 189, 281)
$\text{C}_6\text{H}_6\text{I}$	Iodobenzene	1.8308 ²⁰	5	(189, 278)
$\text{C}_6\text{H}_6\text{NO}_2$	Nitrobenzene	1.1229 ⁹	2	(250, 257)
		1.2032 ²⁰	5	(189, 257)
C_6H_6	Benzene	0.8788 ²⁰	2	(13, 257, 281)
$\text{C}_6\text{H}_7\text{N}$	Aniline	1.03894 ⁹	2	(252, 257)
$\text{C}_6\text{H}_{10}\text{O}_3$	Ethyl acetoacetate	1.02126 ²⁵	2	(233, 245)
$\text{C}_6\text{H}_{10}\text{O}_4$	Diethyl oxalate	1.0728 ²⁵	3	(53, 183, 233)
C_6H_{12}	Cyclohexane	0.7790 ²⁰	5	(79, 219)
$\text{C}_6\text{H}_{12}\text{O}$	Cyclohexanol	0.93254 ⁹	3	(95, 219)
$\text{C}_6\text{H}_{12}\text{O}_2$	Isobutyl acetate	0.8711 ²⁰	2	(13, 218)
$\text{C}_6\text{H}_{12}\text{O}_2$	Ethyl <i>n</i> -butyrate	0.8789 ²⁰	2	(13, 217)
$\text{C}_6\text{H}_{13}\text{I}$	<i>n</i> -Hexyl iodide	1.4652 ⁹		(43, 110)
C_6H_{14}	Diisopropyl	0.6795 ⁹	2	(34, 281)
C_6H_{14}	<i>n</i> -Hexane	0.6770 ⁹	2	(251, 281)
$\text{C}_6\text{H}_{14}\text{O}$	Methylisobutyl carbinol	0.8027 ²⁵	1	(25)
$\text{C}_7\text{H}_5\text{N}$	Benzonitrile	1.0005 ²⁵	3	(24, 61, 189, 256)
$\text{C}_7\text{H}_5\text{NO}$	Phenyl isocyanate	1.0948 ²⁰	5	(24, 31)
$\text{C}_7\text{H}_7\text{Br}$	<i>p</i> -Bromotoluene	1.38134 ⁹	5	(158, 189)
C_7H_8	Toluene	0.88448 ⁹	2	(13, 252)
		0.8658 ²⁰	2	(13, 217, 257)
$\text{C}_7\text{H}_8\text{O}$	<i>o</i> -Cresol	1.0482 ²⁰	5	(19, 218)
$\text{C}_7\text{H}_8\text{O}$	<i>m</i> -Cresol	1.0341 ²⁰	5	(189, 218, 265)
$\text{C}_7\text{H}_8\text{O}$	<i>p</i> -Cresol	1.0345 ²⁰	5	(189, 218)
$\text{C}_7\text{H}_8\text{O}$	Phenyl methyl ether	1.01237 ⁹		(252)
$\text{C}_7\text{H}_9\text{N}$	Methylaniline	0.9825 ²⁵	3	(57, 189)
$\text{C}_7\text{H}_9\text{N}$	<i>o</i> -Toluidine	0.9940 ²⁵	3	(57, 189)

TABLE 3.—ACCURATE VALUES FOR DENSITIES OF LIQUID ORGANIC COMPOUNDS AT PARTICULAR TEMPERATURES.—(Continued)

Formula	Name	d_4^t	$10^4 \Delta$	Lit.
C ₇ H ₁₆	n-Heptane	0.6879 ¹⁵	2	(35, 247, 281)
C ₈ H ₈ O	Acetophenone	1.02383 ²⁵	1	(56, 156)
C ₈ H ₁₀	m-Xylene	0.8643 ²⁰	3	(81, 218, 276)
C ₈ H ₁₀	p-Xylene	0.8611 ²⁰	2	(133, 189, 220)
C ₈ H ₁₀ O	Phenetole	0.9621 ²⁵	3	(7, 18, 112)
C ₈ H ₁₁ N	Dimethylaniline	0.9562 ²⁰	5	(19, 216)
C ₈ H ₁₆ O ₂	Octoic acid	0.9101 ^{20, 02}		(76)
		0.8862 ^{50, 27}		(57)
C ₈ H ₁₉ N	Diisobutylamine	0.7444 ²⁰	5	(89, 185)
C ₈ H ₂₀ Si	Tetraethylsilicane	0.76734 ^{19, 93}	0.5	(104)
C ₉ H ₇ N	Quinoline	1.0900 ²⁵	2	(189, 208, 245)
C ₉ H ₁₀ O ₂	Ethyl benzoate	1.0420 ²⁵	5	(189, 213)
C ₉ H ₁₂	n-Propylbenzene	0.8616 ²⁰	3	(71, 189, 219)
C ₉ H ₁₈ O ₂	Nonoic acid	0.8813 ^{50, 17}		(76)
		0.9087 ¹⁵		
C ₉ H ₂₀	n-Nonane	0.7221 ¹⁵	5	(37, 123)
C ₁₀ H ₈	Naphthalene	0.9623 ¹⁰⁰	5	(2, 128, 228)
C ₁₀ H ₁₄	Cymene	0.8570 ²⁰	3	(22, 133, 189)
C ₁₀ H ₁₄ N ₂	Nicotine	1.0093 ²⁰	3	(105, 206)
C ₁₀ H ₂₀ O ₂	Decoic acid	0.8884 ^{35, 05}		(76)
		0.8773 ^{50, 17}		
C ₁₀ H ₂₂	2, 6-Dimethyloctane	0.7239 ²⁰	2	(64, 133)
C ₁₁ H ₂₂ O ₂	Undecoic acid	0.8889 ³⁰		(76)
		0.8741 ^{50, 15}		
C ₁₁ H ₂₄	n-Undecane	0.7452 ¹⁵	10	(123, 223)
C ₁₂ H ₂₄ O ₂	Lauric acid	0.8744 ^{45, 10}		(76)
		0.8707 ^{50, 25}		
C ₁₃ H ₂₈	n-Tridecane	0.7718 ⁰	3	(123)
C ₁₄ H ₁₂ O ₂	Benzyl benzoate§	1.1121 ²⁵		(111)
C ₁₅ H ₃₂	n-Pentadecane	0.7761 ¹⁰	3	(123)
C ₁₆ H ₃₄	n-Hexadecane	0.7757 ¹⁸	2	(123)
C ₁₇ H ₃₆	n-Heptadecane	0.7766 ^{22, 5}	3	(123)
C ₁₈ H ₃₈	n-Octadecane	0.7770 ²⁸	3	(123)
C ₂₀ H ₄₂	n-Eicosane	0.7780 ^{36, 7}	3	(123, 124)

* The equation of Thorpe (247) with $d_4^0 = 1.2018$ reproduces the values of Perkin (185) and Patterson and Thomson (182) and is probably accurate to 0.001 or better from 0 to 30°.

† It is possible that the values are more accurate than here indicated.

‡ Hartley, Thomas and Applebey (92) give a lower value and claim that higher values arise from presence of water, but Timmermans (252) attributes the lower values of well-purified products to presence of homologues. His own values were obtained with synthetic material.

§ No checks are available, but the material had the highest M. P. recorded and should be pure.

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- 4, 103: 133; 13. (54) Dunstan and Mussell, 4, 97: 1935; 10. (55) Dunstan, Thole and Hunt, 4, 91: 1728; 07. (56) Dutoit and Friederich, 27, 19: 321; 98. (57) Dutoit and Friederich, 149, 9: 105; 00. (58) Efremov, 53, 50: 364; 18. (59) Egerton and Lee, 5, 103: 487; 23.
- (60) Eijkman, 25, 25: 3069; 92. (61) Eijkman, 70, 12: 157; 93. (62) Eijkman, 70, 15: 52; 96. (63) Eijkman, Oeuvres Posth., p. 443. (64) Eisenlohr, 7, 75: 585; 11. (65) Elsässer, 13, 218: 302; 83. (66) Emmerling and Lengyel, 13, Supp. 7: 101; 70. (67) English and Turner, 4, 105: 1656; 14. (68) Ewins, 4, 105: 350; 14. (69) Falk, 1, 31: 86; 09.
- (70) Falk, 1, 31: 806; 09. (71) Faust, 7, 79: 97; 12. (72) Frankland and Barrow, 4, 105: 990; 14. (73) Frankland, Carter and Adams, 4, 101: 2470; 12. (74) Frankland and Garner, 4, 115: 636; 19. (75) Frankland and Turnbull, 4, 105: 456; 14. (76) Garner and Ryder, 4, 127: 720; 25. (77) Garner, Saxton and Parker, 11, 46: 236; 11. (78) Gartenmeister, 7, 6: 524; 90. (79) Gay, 16, 6: 36; 16.
- (80) Gerlach, 167, 38 II: 2089; 85. (81) Getman, 11, 44: 145; 10. (82) Getman, 11, 45: 539; 11. (83) Grinakovskii, 53, 45: 1210; 13. (84) Guye and Baud, 34, 132: 1553; 01. (85) Guye and Mallet, 149, 13: 274; 02. (86) Gyr, 25, 41: 4322; 08. (87) Hall, 4, 123: 32; 23. (88) Hall, 4, 123: 105; 23. (89) Harkins, Clark and Roberts, 1, 42: 700; 20.
- (90) Harries, 25, 32: 1326; 99. (91) Harries, 13, 330: 185; 04. (92) Hartley, Thomas and Applebey, 4, 93: 538; 08. (93) Henry, 186, 1906: 732. (94) Hernquist, Diss., Upsala; 14. (95) Herz and Bloch, 7, 110: 23; 24. (96) Herz and Rathmann, 136, 36: 1417; 12. (97) Herz and Rathmann, 136, 37: 621; 13. (98) Hofmann, 25, 22: 699; 89. (99) Holleman, 70, 23: 357; 04.
- (100) Holmes, 4, 103: 2147; 13. (101) Homfray and Guye, 42, 1: 505; 04. (102) Jacobson and Neumeister, 25, 15: 599; 82. (103) Jaeger, 93, 101: 1; 17. (104) Jaeger and Dijkstra, 64P, 27: 403; 24. (105) Jephcott, 4, 115: 104; 19. (106) Jezewski, 165, 1921A: 110. (107) Jungfleisch, 6, 15: 186; 68. (108) Kahlbaum, 7, 26: 577; 98. (109) Kailan, 91, 51: 81; 12.
- (110) Karvonen, 175, 3A: No. 7; 12. (111) Kendall and Monroe, 1, 43: 115; 21. (112) Kendall and Wright, 1, 42: 1776; 20. (113) Kenyon, 4, 105: 2226; 14. (114) Kenyon and McNicol, 4, 123: 14; 23. (115) Kenyon and Pickard, 4, 105: 2262; 14. (116) Kenyon and Pickard, 4, 105: 2644; 14. (117) Kenyon and Pickard, 4, 107: 35; 15. (118) Kenyon and Pickard, 4, 107: 115; 15. (119) Klason and Norlin, 167, 58 II: 173; 05-8.
- (120) Knops, 13, 248: 175; 88. (121) Körber, 8, 37: 1014; 12. (122) Kopp, 13, 94: 257; 55. (123) Krafft, 25, 15: 1687; 82. (124) Krafft, 25, 19: 2218; 86. (125) Krasuskii, 53, 34: 287; 02. (126) Kremann, Weingast and Gugl, 57, 35: 1235; 14. (127) Kuenen and Wissner, 168, No. 136: 13. 64V, 21: 22; 13. (128) Kultasev, Diss., Dorpat, 15. (129) Kurnakov, Krotkov and Oksman, 53, 47: 558; 15.
- (130) Kurnakov, Perel'muter and Kanov, 169, 24: 399; 16. (131) Kurnakov and Zhemchuzhnyi, 169, 18: 125; 12. (132) Lambrette, Diss., Brussels, 23. (133) Landolt and Jahn, 7, 10: 289; 92. (134) Lebo, 1, 43: 1005; 21. (135) Lieben and Rossi, 13, 159: 70; 71. (136) Lievens, Diss., Brussels, 0. (137) Loomis, 7, 32: 578; 00. (138) Louguinine, 6, 11: 453; 67. (139) Lumsden, 4, 87: 90; 05.
- (140) Lumsden, 4, 91: 24; 07. (141) Maass and Boomer, 1, 44: 1709; 22. (142) Maass and McIntosh, 1, 36: 737; 14. (143) Maass and Wright, 1, 43: 1098; 21. (144) Mains, 33, 26: 779; 22. (145) Marshall, 4, 89: 1350; 06. (146) Mathews and Faville, 50, 22: 1; 18. (147) McCrae and Patterson, 4, 77: 1096; 00. (148) McIntosh, 50, 11: 306; 07. (149) Merry and Turner, 4, 105: 748; 14.
- (150) Meyer and Mylius, 7, 95: 349; 20. (151) Mitchell and Smith, 4, 103: 489; 13. (152) Morgan, 1, 33: 672; 11. (153) Morgan and Chazal, 1, 35: 1821; 13. (154) Morgan and Cramer, 1, 35: 1834; 13. (155) Morgan and Egloff, 1, 38: 844; 16. (156) Morgan and Lammert, 1, 46: 881; 24. (157) Morgan and Stone, 1, 35: 1505; 13. (158) Müller, 7, 86: 177; 14. (159) Mussell, Thole and Dunstan, 4, 101: 1008; 12.
- (160) Naccari and Pagliani, 427, 6: 87; 82. (161) Nasini, 25, 15: 2878; 82. (162) Nasini and Bernheimer, 36, 13: 317; 83. (163) Nasini and Bresciani, 36, 43 II: 281; 13. (164) Nasini and Bresciani, 170, 9: 341; 13. (165) Norris and Green, 11, 26: 293; 01. (166) Osborne, McKelvy and Bearce, 31A, 9: 327; 13. (167) Ott, 13, 392: 245; 12. (168) Pascal, 34, 156: 1904; 13. (169) Patterson, 4, 79: 167; 01.
- (170) Patterson, 4, 85: 765; 04. (171) Patterson, 4, 85: 1116; 04. (172) Patterson, 4, 93: 1836; 08. (173) Patterson, 4, 103: 145; 13. (174) Patterson, 4, 109: 1139; 16. (175) Patterson and Davidson, 4, 101: 374; 12. (176) Patterson and Forsyth, 4, 103: 2263; 13. (177) Patterson and MacDonald, 4, 93: 936; 08. (178) Patterson and Moudgill, 68, 39: 18; 18. (179) Patterson and Patterson, 4, 107: 142; 15.
- (180) Patterson and Pollock, 4, 105: 2322; 14. (181) Patterson and Taylor, 4, 87: 33; 05. (182) Patterson and Thomson, 4, 93: 355; 08. (183) Perkin, 4, 45: 421; 84. (184) Perkin, 4, 51: 808; 87. (185) Perkin, 4, 55: 680; 89. (186) Perkin, 4, 61: 800; 92. (187) Perkin, 4, 63: 488; 93. (188) Perkin, 4, 65: 402; 94. (189) Perkin, 4, 69: 1025; 96.
- (190) Perkin, 4, 81: 292; 02. (191) Petterson, 52, 24: 293; 81. (192) Phillips, 4, 123: 22; 23. (193) Pickard, Hunter, Lewcock and de Pennington, 4, 117: 1248; 20. (194) Pickard and Kenyon, 4, 99: 45; 11. (195) Pickard

- and Kenyon, 4, 101: 620; 12. (196) Pickard and Kenyon, 4, 101: 1427; 12. (197) Pickard and Kenyon, 4, 103: 1923; 13. (198) Pickard and Kenyon, 4, 105: 830; 14. (199) Pickard and Kenyon, 4, 105: 1115; 14. (200) Pickard, Kenyon and Hunter, 4, 123: 1; 23. (201) Pickard and Littlebury, 4, 101: 109; 12. (202) Pictet, 167, 35: 854; 82. (203) Pierre and Puchot, 6, 22: 234; 71. (204) Pierre and Puchot, 13, 163: 253; 72. (205) Polowzow, 7, 75: 513; 11. (206) Pribram and Glücksmann, 57, 18: 303; 97. (207) Price, 4, 115: 1116; 19. (208) Prilezhaev, 53, 42: 1387; 10. (209) Purdie and Irvine, 4, 79: 957; 01. (210) Ramsay and Young, 4, 49: 790; 86. (211) Rayman, *Diss.*, Budapest, 06. (212) Read and Hook, 4, 117: 1214; 20. (213) Reid, 172, 25: 423; 12. (214) Reilly and Ralph, 117, 15: 597; 19. (215) Richards and Barry, 1, 37: 993; 15. (216) Richards and Carver, 1, 43: 827; 21. (217) Richards and Coombs, 1, 3: 1656; 15. (218) Richards and Mathews, 1, 30: 8; 08. (219) Richards and Shipley, 1, 38: 989; 16. (220) Richards, Stull, Mathews and Speyers, 1, 34: 971; 12. (221) Rüber, 9, 29: 334; 23. (222) Ronalds, 4, 18: 54; 65. (223) Ross and Leather, 173, 31: 284; 06. (224) Ruttan, 172, 25: 431; 12. (225) Sabatier and Mailhe, 34, 140: 350; 05. (226) Scheij, 70, 18: 169; 99. (227) Schenck and Kintzinger, 70, 42: 759; 23. (228) Scheuer, 7, 72: 513; 10. (229) Schiff, 13, 220: 71; 83. (230) Schiff, 13, 223: 247; 84. (231) Schreiner, 93, 122: 201; 22. (232) Schwes, 186, 1908: 814. (233) Schwes, 42, 9: 15; 11. (234) Schwes, 4, 99: 1478; 11. (235) Schwes, 22, 20 II: 398; 11. (236) Schwes, 4, 101: 1889; 12. (237) Seubert, 25, 22: 2519; 89. (238) Shorthose, B40. (239) Squibb, 1, 17: 187; 95.

- (240) Sugden, 4, 125: 1177; 24. (241) Sugden, Reed and Williams, 4, 127: 1525; 25. (242) Sugden and Wilkins, 4, 127: 2517; 25. (243) Sugden and Whittaker, 4, 127: 1868; 25. (244) Taylor and Smith, 1, 44: 2450; 22. (245) Thole, 7, 74: 683; 10. (246) Thole, 4, 103: 317; 13. (247) Thorpe, 4, 37: 141; 80. (248) Thorpe and Jones, 4, 63: 273; 93. (249) Thorpe and Rodger, 62, 185A: 397; 94. (250) Timmermans, 28, 24: 244; 10. (251) Timmermans, 28, 25: 300; 11. (252) Timmermans, 117, 13: 310; 12. (253) Timmermans, 186, 32: 299; 23. (254) Timmermans and Martin, University of Brussels, Belgium, 0. (255) Tromp, 70, 41: 278; 22. (256) Turner and Merry, 4, 97: 2069; 10. (257) Tyrer, 4, 105: 2534; 14. (258) Veley, 5B, 82: 217; 10. (259) Vespignani, 36, 33 I: 76; 03. (260) Vincent and Delachanal, 27, 31: 11; 79. (261) Wade and Merriman, 4, 101: 2429; 12. (262) Walden, 7, 20: 569; 96. (263) Walden, 7, 55: 1; 06. (264) Walden, 7, 55: 207; 06. (265) Walden, 7, 59: 385; 07. (266) Walden, 7, 65: 129; 08. (267) Walden, 7, 75: 555; 11. (268) Walden and Swinne, 7, 69: 700; 12. (269) Walden and Swinne, 7, 82: 271; 13. (270) Wallace and Atkins, 4, 101: 1958; 12. (271) Weger, 13, 221: 61; 83. (272) Wiens, 13, 253: 289; 89. (273) Wilkinson and Wernland, 1, 42: 1382; 20. (274) Williams, 1, 47: 2644; 25. (275) Winkler, 25, 38: 3612; 05. (276) Winther, 7, 41: 161; 02. (277) Wood, Such and Searf, 4, 123: 600; 23. (278) Young, 4, 55: 486; 89. (279) Young, 4, 59: 911; 91. (280) Young, 3, 33: 153; 92. (281) Young, 117, 12: 374; 10. (282) Young and Fortey, 4, 77: 1126; 00. (283) Young and Fortey, 4, 81: 717; 02. (284) Young and Fortey, 4, 83: 45; 03. (285) Young and Thomas, 4, 63: 1191; 93. (286) Zawadzki, 136, 30: 299; 06. (287) Zoubov, 53, 30: 926; 98.

THE LIQUID (INCLUDING VITREOUS) STATE UNDER PRESSURES HIGHER THAN ATMOSPHERIC. (DENSITY, THERMAL EXPANSION AND COMPRESSIBILITY)

LOUIS AND JEAN DÉCOMBE

Except as otherwise noted below, the tables in this section constitute a complete index of substances for this subject.

Abbreviations and Units.—The quantity recorded in the following tables, except as otherwise noted, is $\beta = \frac{-10^6}{V} \left(\frac{\partial V}{\partial p} \right)_T$ or $\frac{10^6}{V_1} \left(\frac{V_1 - V_2}{p_2 - p_1} \right)_T$, according as a single pressure or a pressure range is given. The pressure unit is the megabarye. (Cf. Vol. I, p. 34, "barye.")

To convert megabaryes		To convert "per megabarye"	
	Multiply by		Multiply by
To atm.	0.987	To per atm.	1.013
To lb./in. ²	14.50	To per (lb./in. ²) ...	0.0689
To kg/cm ²	1.0197	To per (kg/cm ²) ...	0.9806

A-TABLE, NON-METALLIC ELEMENTS

For metallic elements, v. p. 46

VALUES OF β AT 20° (23)

p_1, p_2	0-100	100-200	200-300	300-400	400-500
Br	(625)†	57	54	51	49
Cl*	(116)	(108)	(100)	(89)	(83)

* Estimated; not directly measured. † Extrapolated.

VALUES OF β BETWEEN 1 AND 14 700 MEGABARYES (7)

H, $\beta > 31$ at -260° ; He, $\beta > 38$ at -271.6° ; N, $\beta > 15$ at -205° .

B-TABLE, INORGANIC COMPOUNDS

Substance	$t, ^\circ\text{C}$	p_1, p_2	β	Lit.
H ₂ O	v. page 40.			
H ₂ SO ₄ , concd.	12.6	1-163	ca. 33	(1)
NH ₃	12.6	1-224	ca. 37	(1)
HNO ₃ , $d_4^0 = 1.403$	0	1-32	ca. 35	(9)
PCl ₃	v. page 40.			
CO ₂	v. Tables 1 and 2, p. 37, 38.			

C-TABLE, CARBON COMPOUNDS

CCl₄, Carbon tetrachloride, cf. Tables 5 and 9

$t, ^\circ\text{C}$	p_1, p_2 megabaryes	β
20° (23)	1-100	90
	100-200	88
	200-300	82
	300-400	74
	400-500	69
24.6° (10)	29.4	99
	98.1	93
	196.2	86
	294.3	79
	392.4	73
	490.5	67
	588.6	62

CO₂, v. Tables 1 and 2

CS₂, v. p. 41

CHBr₃, Bromoform

20° (23)	1-100	(50)*
	100-200	47
	200-300	43
	300-400	41
20° (22)	400-500	(40)*
	100-300	45
	300-500	41
	100-500	43

* Extrapolated.

CHCl₃, Chloroform, v. also Table 5

20° (23)	1-100	(93)*
	100-200	88
	200-300	79
	300-400	72
	400-500	(67)*

CHCl₃.—(Contd.)

$t, ^\circ\text{C}$	p_1, p_2 megabaryes	β
20° (22)	100-300	83
	300-500	70
	100-500	76
100° [B. P. 60°] (2)	8-9	208
	19-36	203
25° (11)	1-6	105
24.6° (10)	29.4	99
	98.1	91.5
	196.2	83
	294.3	77
	392.4	72
	490.5	66
	588.6	61

* Extrapolated.

CH₃I, Methyl iodide, v. Table 5

CH ₃ NO ₂ , Nitromethane (13)		
18.36°	1-9.1	68.5
24.85°	1-9.1	71

CH₃O, Methyl alcohol, v. p. 41

C ₂ Cl ₄ , Tetrachloroethylene		
10°	(14)	1-5.3
58.5°		69
98°		93
		1-5.3
		123

C₂H₄, Ethylene, v. Table 2

C ₂ H ₄ Br ₂ , Ethylene bromide		
10°	(14)	55
64°		76
100°		96
		1-5.3

$C_2H_4Br_2$.—(Continued)			$C_3H_8O_3$, Glycerol $d_{15}^{16.5} = 1.245$ (17)			$C_5H_{10}O_2$, Valeric acid			$C_6H_{10}O$, Cyclohexanone		
$t, ^\circ C$	p_1, p_2 mega- baryes	β	$t, ^\circ C$	p_1, p_2 mega- baryes	β	$t, ^\circ C$	p_1, p_2 mega- baryes	β	$t, ^\circ C$	p_1, p_2 mega- baryes	β
20° (23)	100–300 300–500 100–500	54 49 52	14.9°	1–10.1	22	20° (22)	100–300 300–500 100–500	77 64 70.5	20° (21)	100–300 300–500 100–500	58 51 54
$C_2H_4Cl_2$, Ethylene chloride, <i>cf. also</i> Table 5			$C_4H_8O_2$, Ethyl acetate, <i>cf.</i> Table 5			C_5H_{12} , Pentane B. P. 30–35° (2)			$C_6H_{10}O_4$, Ethyl oxalate, <i>v.</i> Table 5		
10° } (14) 75° }	1–5.3	67 110	20° (22)	100–300 300–500 100–500	90 75 83	13.1° 13.1° 99.4° 99.4°	9–26 9–37.5 9–13.5 9–38	177 170 532 522	C_6H_{12} , Cyclohexane, <i>cf.</i> <i>also</i> Table 5		
20° (22)	100–300 300–500 100–500	67.5 58 63	B. P. = 72° 13.3° } (2) 99.6° }	8.2–37.9 8.2–37.6	103 247	C_5H_{12} , Isopentane, <i>v.</i> Tables 4 and 5			20° (21) | 100–200 | 93		
0° (10)	29.4 98.1 196.2 294.3 392.4 490.5 588.6	76 71 66 61.5 58 55 52.5	$C_4H_8O_2$, Propyl formate			$C_5H_{12}O$, Amyl alcohol, <i>v.</i> p. 42			$C_6H_{12}O$, Cyclohexanol		
			20° (22)	100–300 300–500 100–500	87 72 79.5	$C_5H_{12}O$, Isoamyl alcohol			40° } (21) 34.16° }		
						20° (22)	100–300 300–500 100–500	84 69.5 77	100–300 { 56 54		
			$C_4H_{10}O$, <i>n</i> -Butyl alcohol			C_6H_5Br , Bromobenzene, <i>v.</i> Table 9			$C_6H_{12}O_2$, Isoamyl formate		
			3.05° } (24) 17.4° }	1–8.1	82 89	C_6H_5Cl , Chlorobenzene, <i>v.</i> <i>also</i> Tables 5 and 9			20° (22) | 100–300 | 80 300–500 | 68 100–500 | 74		
			20° (22)	100–300 300–500 100–500	76.5 64 70	C_6H_5F , Fluorobenzene			$C_6H_{12}O_2$, Isobutyl acetate		
$C_2H_4O_2$, Acetic acid, <i>v.</i> Table 5			$C_4H_{10}O$, Isobutyl alcohol, <i>v.</i> p. 42			13.3° } (25) 35.4° } 100.4° }	0.4–18.2	66 76 126	20° (22) | 100–300 | 87 300–500 | 72 100–500 | 80		
C_2H_5Br , Ethyl bromide, <i>v.</i> p. 41			$C_4H_{10}O$, <i>tert.</i> -Butyl alcohol			$C_6H_5NO_2$, Nitrobenzene, <i>v.</i> Table 5			$C_6H_{12}O_2$, Ethyl <i>n</i> -butyrate		
C_2H_5Cl , Ethyl chloride, <i>v.</i> p. 41			20° (22)	100–300 300–500 100–500	89 70 80	C_6H_6 , Benzene, <i>cf. also</i> Table 5			20° (22) | 100–300 | 85 300–500 | 71 100–500 | 78		
C_2H_5I , Ethyl iodide, <i>v.</i> p. 41			$C_4H_{10}O$, Ethyl ether, <i>v.</i> p. 42			13.9° } (25) 35.4° } 99.7° }	0.4–18.2	87 101 187	10° } (14) 62.5° } 97° }		
$C_2H_5NO_3$, Ethyl nitrate (9)			C_5H_{10} , Isoamylene (25)			$C_6H_5NO_2$, Nitrobenzene, <i>v.</i> Table 5			1–5.3 { 92 134 182.5		
0°	1–24	ca. 71	16.7° 34.7°	0.4–18.2 0.2–18.2	168 206.5	$C_6H_5NO_2$, Nitrobenzene, <i>v.</i> Table 5			$C_6H_{12}O_2$, Ethyl isobutyrate		
C_2H_6O , Ethyl alcohol, <i>v.</i> p. 41			$C_5H_{10}O$, Diethyl ketone			0° (9)	1–26	ca. 72	20° (23) | 100–300 | 90 300–500 | 75 100–500 | 82		
$C_2H_6O_2$, Glycol			20° (22)	100–300 300–500 100–500	34 32 33	C_6H_6 , Benzene, <i>cf. also</i> Table 5			$C_6H_{12}O_2$, Methyl <i>n</i> -valerate		
C_3H_6O , Allyl alcohol, <i>cf.</i> Table 3			20° (22)	100–300 300–500 100–500	84 70 77	6° } (24) 17.9° }	1–8	82 90.5	10° } (14) 63° } 100° }		
9.6° (3)	1–507 507–1013 1013–1520 1520–2026 2026–2533	68 50 42 36 31	20° (21)	100–300 300–500 100–500	84 70 77	12.9° } (25) 34.9° } 99.9° }	0.4–18 2–18 4.5–19	86 99 187	1–5.3 { 90 132 181		
			$C_5H_{10}O_2$, Isobutyl formate			99.3° (2)	8–38	185	$C_6H_{12}O_2$, Methyl isovalerate		
			20° (22)	100–300 300–500 100–500	86 72 79	20° (20, 21)	100–300 300–500 100–500	78 66.5 72	20° (22) | 100–300 | 84 300–500 | 70 100–500 | 77		
			$C_5H_{10}O_2$, Ethyl propionate			21° (8)	1–51 1–101 1–253 1–507	96 94 90 77	$C_6H_{12}O_3$, Paraldehyde		
			20° (22)	100–300 300–500 100–500	87.5 72.5 80	C_6H_{14} , Hexane			12.13° } (13) 17.91° }		
C_3H_6O , Acetone, <i>v.</i> p. 42			$C_5H_{10}O_2$, Methyl <i>n</i> -butyrate			C_6H_{14} , Hexane			C_6H_{14} , Hexane		
$C_3H_6O_2$, Methyl acetate, <i>cf. also</i> Table 5			10° } (14) 62° }	1–5.3	88 132	29.4 98.1 196.2 294.3 392.4 490.5 588.6	91 85 79 73.5 68 63 60	B. P., 66–72° 13° } (2) 99° }	9–38 8.6–38	141 351	
B. P. 58° } (2) 14.3° } 99.7° }	8.2–38 8.4–37.5	95.5 247	20° (22)	100–300 300–500 100–500	84 70 77	C_6H_7N , Aniline, <i>cf. also</i> Table 5			B. P., 68° 23° (5)		
20° (22)	100–300 300–500 100–500	87.5 73 80	$C_5H_{10}O_2$, Methyl isobutyrate			17.95° } (13) 24.74° }	1–9	44 45	1–1 157		
C_3H_8O , <i>n</i> -Propyl alcohol, <i>v.</i> p. 42			20° (22)	100–300 300–500 100–500	89 74 81				20° (22); <i>cf.</i> (2, 5)		
C_3H_8O , Isopropyl alcohol (24)									100–300 | 117.5 300–500 | 91 100–500 | 104		
5.65° 17.85°	1–8.1 1–8.1	94 102							C_6H_{14} , Isohexane		
									20° (22)	100–300 300–500 100–500	119 93 106

C₇H₈, Toluene, cf. also Tables 5 and 7		
<i>t</i> , °C	<i>p</i> ₁ , <i>p</i> ₂ mega- baryes	β
10° } (14)	1-5.3	78
66° }		113
100° }		148.5
0°	100-300	66
0° (20)	300-500	58
20° (21)	100-300	74
	300-500	64
	100-500	69
C₇H₈O, Benzyl alcohol		
17.85° } (13)	1-9.1	46
25.02° }		47
20° (22)	100-300	43
	300-500	38
	100-500	41
C₇H₈O, Phenyl methyl ether, anisole		
11.87° } (13)	1-9.1	60
17.95° }		62
C₇H₈O, <i>o</i>-Cresol		
20° (22)	100-300	44
	300-500	42
	100-500	43
C₇H₈O, <i>m</i>-Cresol		
20° (22)	100-300	45.5
	300-500	41.5
	100-500	43.5
17.78° } (13)	1-9.1	49
25.29° }		50
C₇H₈O, <i>p</i>-Cresol		
20° (22)	100-300	44
	300-500	42
	100-500	43
C₇H₉N, Methylaniline		
20° (22)	100-300	45
	300-500	40.5
	100-500	43
C₇H₉N, <i>o</i>-Toluidine		
20° (22)	100-300	44
	300-500	39
	100-500	41
C₇H₉N, <i>m</i>-Toluidine		
20° (22)	100-300	45
	300-500	41
	100-500	43
C₇H₉N, <i>p</i>-Toluidine, v. Table 8		
C₇H₁₂O₄, Ethyl malonate, v. Table 5		
C₇H₁₄O₂, Ethyl valerate		
10° } (14)	1-5.3	94.5
62.5° }		137
100° }		180

C₇H₁₆, Heptane B. P. = 90-94°		
<i>t</i> , °C	<i>p</i> ₁ , <i>p</i> ₂ mega- baryes	β
13.8° } (2)	8-38	120
99.5° }		266
B. P. = 93°		
23° (5)	ca. 0.07-1	132
C₈H₁₀, Ethylbenzene, v. also Table 9		
20° (21)	100-300	71
	300-500	61
	100-500	66
17.89° } (13)	1-9.1	81
25.28° }		84.5
C₈H₁₀, Xylene, v. Tables 5, 6, 7		
C₈H₁₁N, Dimethylaniline		
20° (22)	100-300	52
	300-500	45
	100-500	48
C₈H₁₁N, Ethylaniline		
20° (22)	100-300	50
	300-500	45
	100-500	47
C₈H₁₆O₂, Butyl butyrate		
10° } (14)	1-5.3	89
63° }		128
100° }		168
C₈H₁₈, Octane		
20° (22)	100-300	97.5
	300-500	78
	100-500	88
23° (5)	ca. 0.07-1	120*
C₈H₁₈, 2, 5-Dimethylhexane		
20° (22)	100-300	105
	300-500	84.5
	100-500	95
C₈H₁₈, 2-Methylheptane		
20° (22)	100-300	101
	300-500	82
	100-500	91
C₈H₁₈, 3, 4-Dimethylhexane		
20° (22)	100-300	94.5
	300-500	74
	100-500	84
C₈H₁₈, 3-Ethylhexane		
20° (22)	100-300	96
	300-500	78
	100-500	87
C₉H₁₂, <i>n</i>-Propylbenzene		
20° (21)	100-300	69.7
	300-500	60.1
	100-500	64.9
C₉H₁₂, Isopropylbenzene		
20° (21)	100-300	70.3
	300-500	60.4
	100-500	65.4

* B. P. = 117°.

C₉H₁₂, Cumene, v. Table 7		
C₉H₁₂, Pseudocumene, v. also Table 9		
<i>t</i> , °C	<i>p</i> ₁ , <i>p</i> ₂ mega- baryes	β
20° (21)	100-300	64
	300-500	56
	100-500	60
C₉H₁₂, Mesitylene		
20° (21)	100-300	67
	300-500	58
	100-500	63
C₉H₁₈O₂, Butyl valerate		
10° } (14)	1-5.3	91
63.5° }		128.5
100° }		171
C₉H₁₈O₂, Amyl butyrate		
10° } (14)	1-5.3	85
63.5° }		121
97° }		155
C₉H₂₀, Nonane B. P. = 137° (5)		
23°	ca. 0.07-1	111
C₉H₂₀, 2, 4-Dimethylheptane		
20° (21)	100-300	96
	300-500	79
	100-500	87
C₉H₂₀, 2, 5-Dimethylheptane		
20° (21)	100-300	95
	300-500	77
	100-500	86
C₁₀H₁₄, <i>tert</i>-Butylbenzene		
20° (21)	100-300	68
	300-500	59
	100-500	63
C₁₀H₁₄O, Thymol, v. Table 8		
C₁₀H₁₅N, Diethylaniline		
20° (22)	100-300	54
	300-500	47.5
	100-500	51

C₁₀H₂₀O₂, Amyl valerate		
<i>t</i> , °C	<i>p</i> ₁ , <i>p</i> ₂ mega- baryes	β
10° } (14)	1-5.3	87
62.7° }		120
99° }		154
C₁₀H₂₀O₂, Capric acid, v. Table 8		
C₁₀H₂₂, Decane B. P. = 160° (5)		
23°	ca. 0.07-1	104
C₁₁H₁₄O₂, Butyl benzoate		
10° } (14)	1-5.3	58
64° }		79
100° }		97
C₁₁H₂₄, Undecane B. P. = 181° (5)		
23°	ca. 0.07-1	96
C₁₂H₁₁N, Diphenylamine, v. Table 8		
C₁₂H₁₆O₂, Isoamyl benzoate		
10° } (14)	1-5.3	57
65° }		76.5
100° }		91
C₁₂H₂₆, Dodecane B. P. = 199° (5)		
23°	ca. 0.07-1	90.5
C₁₃H₂₈, Tridecane B. P. = 219° (5)		
23°	ca. 0.07-1	86
C₁₄H₃₀, Tetradecane B. P. = 238° (5)		
23°	ca. 0.05-1	82
C₁₅H₃₂, Pentadecane B. P. = 260° (5)		
23°	ca. 0.07-1	78
C₁₆H₃₂O₂, Palmitic acid, v. Table 8		
C₁₆H₃₄, Hexadecane B. P. = 280° (5)		
23°	ca. 0.07-1	74

TABLE 1.—CO₂. VALUES OF $\beta = \frac{-10^6}{V} \left(\frac{\partial V}{\partial p} \right)_T$ (16)
v. also Table 2

<i>t</i> , °C	-37	-30	-20	-10	0	+5	10	15	20	25	30
<i>p</i>											
13.8	220										
14.5		305									
20.7			550								
27.6		290	490	900							
35.9					1 050						
41.4		275	400	680		1 400					
44.8							1 730				
55.2		260	340	520	830	1 120	1 500	2 360			
56.55									4 060		
63.45										5 940	
69		245	290	400	650	900	1 190	1 740	2 900	5 070	
75.9											16 500
82.8		230	260	320	540	720	940	1 270	1 930	3 200	7 400
89.7											4 900
96.6		215	230	290	430	570	730	910	1 200	1 740	2 750

TABLE 2.—VALUES OF pv

The volume unit is the volume of the gaseous substance at 0° and 1 atm. (4)

p , atm.	CO_2 , <i>v. also</i> Table 1				C_2H_4
	0°	10°	20°	30°	0°
1	1.0000				1.0000
50	0.1050	0.1145			0.1755
75	0.1530	0.1630	0.1800	0.2190	0.2425
100	0.2020	0.2130	0.2285	0.2550	0.3100
125	0.2490	0.2620	0.2785	0.3000	0.3750
150	0.2950	0.3090	0.3260	0.3460	0.4405
175	0.3405	0.3550	0.3725	0.3930	0.5040
200	0.3850	0.4010	0.4190	0.4400	0.5650
225	0.4305	0.4455	0.4655	0.4875	0.6270
250	0.4740	0.4900	0.5100	0.5335	0.6870
275	0.5170	0.5340	0.5545	0.5775	
300	0.5595	0.5775	0.5985	0.6225	0.8055
350	0.6445	0.6640	0.6850	0.7090	0.9229
400	0.7280	0.7475	0.7710	0.7950	1.0365
450	0.8090	0.8310	0.8550	0.8800	1.1465
500	0.8905	0.9130	0.9380	0.9630	1.2555
550	0.9700	0.9935	1.0200	1.0465	1.3640
600	1.0495	1.0730	1.0995	1.1275	1.4725
650	1.1275	1.1530	1.1800	1.2075	1.5785
700	1.2055	1.2320	1.2590	1.2890	1.6835
750	1.2815	1.3105	1.3395	1.3700	1.7865
800	1.3580	1.3870	1.4170	1.4475	1.8880
850	1.4340	1.4625	1.4935	1.5245	1.9900
900	1.5090	1.5385	1.5685	1.6000	2.0905
950	1.5830	1.6115	1.6430	1.6740	2.1900
1000	1.6560	1.6850	1.7160	1.7480	2.2890

CO_2		C_2H_4 , Ethylene		
p , atm.	pv	p , atm.	pv	
	0°		0°	5°
35	0.0750	41	0.1610	
37	0.0790	42	0.1570	
50	0.1050	43	0.1580	
	10°	44	0.1600	
45	0.1050	46	0.1645	0.1890
50	0.1145	47		0.1850
	20°	48	0.1695	0.1855
57	0.1480	49		0.1875
60	0.1520	50	0.1755	0.1900
	30°	52	0.1810	0.1945
71	0.2300	56		0.2050
72	0.2230	60	0.2025	0.2145
74	0.2190	75	0.2425	0.2535
75	0.2190	80	0.2565	
78	0.2205	100	0.3100	
80	0.2225			

TABLE 3.— $\text{C}_3\text{H}_6\text{O}$, ALLYL ALCOHOL

Volume of the liquid in terms of its volume at 0° and 1 atm. taken as unity (4)

p , atm.	9.60°	35.45°	p , atm.	9.60°	35.45°
1	1.0097	1.0371	1500	0.9296	0.9454
100	1.0015		1600	0.9260	0.9415
200	0.9941		1700	0.9225	0.9378
300	0.9872		1800	0.9192	0.9342
400	0.9808	1.0031	1900	0.9159	0.9307
500	0.9748	0.9962	2000	0.9128	0.9273
600	0.9692	0.9898	2100	0.9097	0.9241
700	0.9638	0.9837	2200	0.9068	0.9209
800	0.9588	0.9779	2300	0.9039	0.9178
900	0.9543	0.9725	2400	0.9011	0.9147
1000	0.9499	0.9674	2500	0.8984	0.9118
1100	0.9455	0.9625	2600	0.8957	0.9090
1200	0.9412	0.9579	2700	0.8931	0.9063
1300	0.9372	0.9535	2800		0.9036
1400	0.9334	0.9494			

TABLE 4.— C_5H_{12} , ISOPENTANE

Values of the specific volume (cm^3/g) at t , °C and p megabaryes (27); *v.* Table 5

t	p	$\frac{1}{3}$	$\frac{2}{3}$	16	$\frac{5}{3}$	$\frac{8}{3}$	32	$\frac{11}{3}$	$\frac{13}{3}$	48	$\frac{16}{3}$	$\frac{17}{3}$	64	$\frac{20}{3}$	$\frac{23}{3}$
10		1.5871	1.5854	1.5838	1.5820	1.5806	1.5790	1.5773	1.5757	1.5742	1.5726	1.5711	1.5696	1.5682	1.5667
15.6		1.6012	1.5994	1.5976	1.5959	1.5941	1.5923	1.5906	1.5889	1.5872	1.5856	1.5839	1.5821	1.5806	1.5791
30		1.6388	1.6366	1.6344	1.6322	1.6300	1.6280	1.6260	1.6240	1.6220	1.6202	1.6184	1.6166	1.6149	1.6131
40		1.6681	1.6655	1.6630	1.6605	1.6581	1.6556	1.6533	1.6510	1.6487	1.6465	1.6444	1.6423	1.6402	1.6382
50		1.6984	1.6953	1.6924	1.6896	1.6868	1.6841	1.6814	1.6788	1.6763	1.6739	1.6715	1.6691	1.6668	1.6645
60		1.7312	1.7277	1.7244	1.7210	1.7179	1.7148	1.7116	1.7086	1.7057	1.7027	1.6999	1.6971	1.6944	1.6916
70		1.7666	1.7625	1.7585	1.7547	1.7510	1.7474	1.7440	1.7405	1.7372	1.7339	1.7306	1.7275	1.7244	1.7212
80		1.8038	1.7992	1.7948	1.7904	1.7861	1.7820	1.7780	1.7740	1.7700	1.7663	1.7625	1.7589	1.7552	1.7516
90		1.8477	1.8420	1.8364	1.8309	1.8255	1.8203	1.8154	1.8106	1.8060	1.8014	1.7974	1.7934	1.7893	1.7749
100			1.8896	1.8825	1.8760	1.8695	1.8634	1.8576	1.8516	1.8460	1.8406	1.8356	1.8306	1.8256	1.8008
110			1.9417	1.9334	1.9253	1.9176	1.9102	1.9029	1.8961	1.8895	1.8830	1.8771	1.8710	1.8652	1.8596
120			2.0037	1.9922	1.9815	1.9713	1.9615	1.9527	1.9445	1.9365	1.9287	1.9215	1.9150	1.9083	1.9015
130				2.0630	2.0485	2.0350	2.0230	2.0115	2.0005	1.9910	1.9810	1.9715	1.9630	1.9540	1.9463
140				2.1512	2.1290	2.1105	2.0940	2.0787	2.0650	2.0520	2.0405	2.0287	2.0185	2.0085	1.9987
150					2.2317	2.2035	2.1782	2.1565	2.1385	2.1210	2.1050	2.0912	2.0780	2.0655	2.0537
160						2.3285	2.2900	2.2575	2.2305	2.2062	2.1852	2.1657	2.1485	2.1322	2.1180
170						2.5252	2.4485	2.3882	2.3450	2.3080	2.2777	2.2512	2.2270	2.2057	2.1872
180							2.7230	2.5835	2.5005	2.4405	2.3985	2.3550	2.3245		
185							3.1830	2.7345	2.6050	2.5270	2.4645	2.4165			
187.8	(Critical point)							2.8585	2.6770	2.5790	2.5075	2.4550	2.4115	2.3745	2.3445

TABLE 5.—ADIABATIC COEFFICIENT

In this table is recorded the mean adiabatic coefficient $[\alpha = -\frac{10^6}{V} \left(\frac{\Delta V}{\Delta p} \right)_Q]$ between 1 and 2 megabaryes, together with the isothermal coefficient $[\beta = -\frac{10^6}{V} \left(\frac{\Delta V}{\Delta p} \right)_T]$ thermodynamically computed therefrom (12, 26).

$t, ^\circ\text{C}$ (26)	CCl ₄ , Carbon tetra- chloride		CHCl ₃ , Chloro- form		C ₂ H ₄ Cl ₂ , Ethylene chloride		C ₂ H ₄ O ₂ , Acetic acid		C ₄ H ₈ O ₂ , Ethyl acetate	
	α	β	α	β	α	β	α	β	α	β
0	62	90	58	85	48	69			69	95
10	67	97	62	92	51	74	72*	87.5*	75	104
20	72	105	67	100	55	80	75	91	82	113
30	78	113	73	109	59	86	80.5	97	90	124
40	84	122	79.5	118	64	92.5	86	104	99	135
50	92	132	86	129	69	100	93	111	108	148
60	100	145	93.5	141	75	108	100	119	118.5	162
70	108	158			81	118	107	128	132	179
80					89	128	115	137		

* At 15°C.

$t, ^\circ\text{C}$ (26)	C ₆ H ₅ Cl, Chloro- benzene		C ₆ H ₅ NO ₂ , Nitro- benzene		C ₆ H ₆ , Benzene		C ₇ H ₈ , Toluene		C ₈ H ₁₀ ,* <i>m</i> -Xylene	
	α	β	α	β	α	β	α	β	α	β
0	49	66	36	44	55	81	58	78	57	74
10	52	70	38	47	60	87	62	84	61	79.5
20	55	74	40	49	65	94.5	67	90	65	85
30	59	79	43	52	71	102	71.5	96	69	90
40	63	84	45	55	77	110	77	103	74.5	96
50	67	89	48	55	84	119	83	111	80	103
60	72	95	50		92	128	90	120	86	110
70	77	101			101	141	97	129.5	92	118
80	82	108			110	154.5	<i>v. also</i> Table 7		99	126

* *v. also* Tables 6 and 7.C₆H₇N, Aniline (26)

$t, ^\circ\text{C}$	α	β	$t, ^\circ\text{C}$	α	β
0	32.5	41	50	42	53
10	34	43	60	45	56
20	36	45	70	47	60
30	38	48	80	50	63
40	40	50	90	53	67

	$t, ^\circ\text{C}$	α	β
CH ₃ I, Methyl iodide (12).....	0.7	54	
	20.9	64	
C ₃ H ₇ O ₂ , Methyl acetate (12).....	0.3	65	89
	23.2	81	112
C ₅ H ₁₂ , Isopentane, <i>v. also</i> Table 4.	0.4	134	178
	23.3	169	222.5
C ₆ H ₁₀ O ₄ , Ethyl oxalate.....	0.8	49	65
	22.7	56	74
C ₆ H ₁₂ , Cyclohexane.....	25	83	110
C ₇ H ₁₂ O ₄ , Ethyl malonate.....	0.9	48	
	24.8	56.5	

TABLE 6.—C₈H₁₀, XYLENE. β AT 20° (22)
v. Tables 5 and 7

p_1, p_2	α -	m -	p -
100-300	66	69.5	72
300-500	57	60	62
100-500	61	65	67

TABLE 7.— $\beta = \beta_0 (1 + at + bt^2)$; 0 TO 100°C; 1-4 MEGABARYES

(18)	β_0	a	b
Toluene.....	76	0.00657	0.04174
Xylene.....	72.4	0.00220	0.04644
Cumene.....	71.6	0.00253	0.04521

TABLE 8.—VALUES OF β (6)

t°	C ₇ H ₉ N, <i>p</i> -Toluidine. M. P. = 43°; B. P. = 198°				
	28	65	100	185	310
p_1, p_2					
20-101	55	66	80	132	360
20-203	55	64	79	125	312
20-304	55	63	78	118	266
20-405	54	61	77	111	223

t°	C ₁₀ H ₁₄ O, Thymol. M. P. = 53.5°; B. P. = 233°				
	28	64	100	185	310
p_1, p_2					
20-101	65	74	95	151	402
20-203	62	70	89	142	334
20-304	59	67	84	133	295
20-405	56	64	79	125	263

t°	C ₁₀ H ₂₀ O ₂ , Capric acid. M. P. = 30°; B. P. = 269°			
	30	65	100	185
p_1, p_2				
20-101	72	90	112	184
20-203	70	86	106.5	173
20-304	68.5	83	101	161
20-405	67	81	96	149

t°	C ₁₂ H ₁₁ N, Diphenylamine. M. P. = 54°; B. P. = 310°			
	65	100	185	310
p_1, p_2				
0-101	61	63	108	199
0-203	60	62	102	187
0-304	58	62	97	174
0-405	57	61	91	161
0-506.5	56	60	86	148

t°	C ₁₆ H ₃₂ O ₂ , Palmitic acid. M. P. = 62°; B. P. = 350°	
	100	185
p_1, p_2		
20-101	98	150
20-203	94	142
20-304	90	135
20-405	87	127

TABLE 9.—COMPRESSIBILITIES ACCORDING TO BIRON (6.5)

$v = a + \frac{c}{b + p}$, at 0°C. Pressure unit, the atm. Volume unit = v at 0°C and zero pressure. Author estimates error < 0.0001.

Formula	Name	a	b	c	p_1, p_2
CCl ₄	Carbon tetrachloride..	0.80365	2264.0	444.54	0-314.3
CCl ₄	Carbon tetrachloride..	0.76862	2728.3	631.10	0-595.7
C ₆ H ₅ Cl	Chlorobenzene.....	0.76671	3625.5	845.78	0-486.4
C ₆ H ₅ Br	Bromobenzene.....	0.84855	2494.0	377.72	0-481.8
C ₇ H ₈	Toluene.....	0.81950	2268.7	409.51	0-589.6
C ₈ H ₁₀	Ethylbenzene.....	0.85745	1755.0	250.18	0-494.7
C ₉ H ₁₂	Pseudocumene.....	0.83285	2408.0	402.50	0-596.0

LITERATURE

(For a key to the periodicals see end of volume)

- (1) Aimé, 6, 8: 257; 1843. (2) Amagat, 6, 11: 520; 77. (3) Amagat, 6, 29: 68, 505; 93. (4) Amagat, 6, 28: 5; 13. (5) Bartoli, 72, 28: 1141; 95. 36, 26 I: 466; 96. (6) Barus, 12, 39: 478; 90. (6.5) Biron, 53, 44: 65; 12. (7) Bridgman, 65, 59: 173; 24. (8) Carnazzi, 59, 9: 161; 05. (9) Colladon and Sturm, 6, 36: 113; 1827. (10) Dolezalek and Speidel, 7, 94: 72; 20. (11) Drecker, 8, 20: 870; 83. (12)

- Gay, 6, 6: 36; 16. (13) Hebeisen, 8, 77: 216; 25. (14) de Heen, 186, 9: 550; 85. (15) Hyde, 5, 97: 240; 20. (16) Jenkin, 5, 98: 170; 20. (17) de Metz, 8, 41: 663; 90. (18) Pagliani and Palazzo, 170, 19: 273; 84. (19) Protz, 8, 31: 127; 10. (20) Richards, Bartlett and Hodges, 1, 43: 1538; 21. (21) Richards and Shipley, 1, 38: 989; 16. (22) Richards, Stull, Mathews and Speyers, 1, 34: 971; 12. (23) Richards and Stull, 1, 26: 399; 04. (24) Röntgen, 8, 44: 1; 91. (25) Suchodski, 7, 74: 257; 10. (26) Tyrer, 7, 87: 182; 14. (27) Young, 67, 13: 602; 95.

THE COMPRESSIBILITIES OF CERTAIN LIQUIDS

P. W. BRIDGMAN

The values recorded below are the relative volumes in terms of the volume at 0° and 1 A_n. The values are nearly all taken from the papers of Bridgman, to which the reader is referred for additional literature references and for the methods by which the data of other observers have been incorporated into the final tables.

The low temperature data of Seitz and Lechner (4) recorded below do not join smoothly with those of Bridgman at 0°.

Les valeurs données ci-dessous sont les volumes relatifs par rapport au volume à 0° et sous 1 A_n. Les valeurs sont presque toutes tirées des mémoires de Bridgman auxquels le lecteur s'adressera pour connaître les sources bibliographiques supplémentaires et les méthodes au moyen desquelles les valeurs d'autres observateurs ont été incorporées dans les tables finales.

Les données de Seitz et Lechner (4) relatives à de basses températures inscrites en bas ne s'accordent pas convenablement avec celles de Bridgman à 0°.

Die unten angegebenen Werte sind relative Volumina, ausgedrückt in Volumen bei 0° und 1 A_n. Die Werte stammen beinahe alle aus den Arbeiten von Bridgman, wo weitere Literatur und die Methoden zu finden sind, nach welchen die Einfügung fremder Beobachtungen in die Endtabelle erfolgte.

Die von Seitz und Lechner (4) für tiefe Temperaturen angegebenen Zahlen fügen sich denen von Bridgman bei 0° nicht glatt an.

I valori qui sotto riportati sono i volumi relativi, riferiti ai volumi a 0° e a 1 A_n. I valori provengono quasi tutti dai lavori di Bridgman, nei quali si trovano ulteriori notizie sulla letteratura, e la indicazione dei metodi seguiti per riunire i dati degli altri osservatori nelle tabelle finali.

I dati di Seitz e Lechner (4) per le temperature basse non si recollegano bene con quelli di Bridgman a 0°.

H₂O, WATER (2)

P, atm.	-15°	-10°	-5°	0°	+10°	20°
0		1.0017	1.0006	1.0000	1.0001	1.0016
500	Freezes	0.9788	0.9776	0.9769	0.9778	0.9804
1 000		.9581	.9572	.9566	.9591	.9619
1 500	0.9386	.9399	.9391	.9286	.9424	.9456
2 000	.9215	.9223	.9233	.9223	.9277	.9712
2 500	.9073	.9083	.9096	.9080	.9147	.9183
3 000	.8949	.8962	.8975	.8954	.9028	.9065
3 500	.8840	.8852	.8865	.8842	.8919	.8956
4 000	.8742	.8751	.8763	.8739	.8818	.8855
4 500		.8658	.8670	.8648	.8725	.8762
5 000		.8573	.8585	.8565	.8639	.8675
5 500			.8509	.8491	.8558	.8593
6 000			.8438	.8423	.8481	.8517
6 500		Freezes	.8373	.8361	.8409	.8444
7 000					.8340	.8374
7 500					.8274	.8307
8 000						.8244
8 500						.8185
9 000						.8128
9 500						.8076
10 000						.8027

P, atm.	-20°
2 000	0.9208
2 500	.9064
3 000	.8941

P, atm.	30°	40°	50°	60°	70°	80°
0	1.0041	1.0076	1.0128	1.0168	1.0224	1.0287
500	0.9831	0.9867	0.9915	0.9967	1.0014	1.0071
1 000	.9652	.9689	.9732	.9780	0.9831	0.9884
1 500	.9492	.9529	.9571	.9617	.9667	.9717
2 000	.9347	.9386	.9428	.9472	.9521	.9568
2 500	.9200	.9257	.9300	.9343	.9390	.9437
3 000	.9083	.9139	.9183	.9225	.9270	.9315
3 500	.8974	.9030	.9074	.9115	.9159	.9203
4 000	.8872	.8931	.8974	.9012	.9055	.9097
4 500	.8779	.8838	.8880	.8919	.8959	.9001
5 000	.8692	.8752	.8792	.8832	.8869	.8913
5 500	.8611	.8671	.8710	.8750	.8790	.8830

H₂O, WATER (2).—(Continued)

P, atm.	30°	40°	50°	60°	70°	80°
6 000	0.8535	0.8595	0.8634	0.8674	0.8713	0.8752
6 500	.8464	.8523	.8562	.8602	.8641	.8679
7 000	.8395	.8456	.8494	.8534	.8572	.8610
7 500	.8331	.8391	.8430	.8469	.8507	.8545
8 000	.8270	.8330	.8369	.8408	.8446	.8481
8 500	.8232	.8273	.8312	.8351	.8389	.8425
9 000	.8177	.8219	.8258	.8297	.8335	.8371
9 500	.8125	.8168	.8207	.8245	.8282	.8318
10 000	.8077	.8119	.8158	.8196	.8233	.8268
10 500	.8030	.8071	.8110	.8148	.8185	.8220
11 000		.8023	.8062	.8101	.8137	.8172
11 500		.7977	.8016	.8055	.8091	.8126
12 000		.7931	.7970	.8009	.8045	.8080

PCl₃, PHOSPHORUS TRICHLORIDE (3)

P, atm.	20°	40°	60°	80°
1	1.0234	1.0485	1.0742	1.1039
500	0.9852	1.0029	1.0226	1.0443
1 000	.9577	0.9722	0.9880	1.0040
1 500	.9363	.9488	.9622	0.9758
2 000	.9184	.9297	.9414	.9531
2 500	.9034	.9135	.9242	.9347
3 000	.8902	.8997	.9096	.9192
3 500	.8784	.8873	.8967	.9053
4 000	.8679	.8763	.8853	.8933
4 500	.8585	.8664	.8750	.8825
5 000	.8499	.8574	.8657	.8728
6 000	.8348	.8418	.8494	.8561
7 000	.8218	.8285	.8353	.8420
8 000	.8105	.8167	.8230	.8292
9 000	.7999	.8057	.8120	.8179
10 000	.7902	.7957	.8020	.8077
11 000	.7816	.7867	.7930	.7983
12 000	.7741	.7789	.7849	.7898

CS₂, CARBON DISULFIDE (3, 4)

P, atm.	20°	40°	60°	80°
1	1.0235	1.0490	1.0774	1.1092
500	0.9854	1.0051	1.0243	1.0458
1 000	.9567	0.9734	0.9887	1.0061
1 500	.9338	.9483	.9615	0.9762
2 000	.9151	.9277	.9397	.9525
2 500	.8994	.9105	.9215	.9327
3 000	.8852	.8953	.9055	.9154
3 500	.8730	.8820	.8916	.9003
4 000	.8620	.8702	.8790	.8870
4 500	.8521	.8596	.8679	.8754
5 000	.8429	.8501	.8578	.8649
6 000	.8265	.8337	.8405	.8468
7 000	.8119	.8196	.8258	.8316
8 000	.7990	.8070	.8130	.8188
9 000	.7875	.7954	.8014	.8071
10 000	.7774	.7844	.7906	.7962
11 000	.7686	.7741	.7802	.7857
12 000	.7609	.7646	.7706	.7758

P, atm.	-100°	-80°	-60°	-40°	-20°	0°
1	0.8994	0.91815	0.93725	0.9571	0.97805	1.0000
500	.8830	.8992	.9155	.93225	.94955	0.96725
1 000		.88345	.8980	.9125	.9273	.9425

CH₃OH, METHYL ALCOHOL (3, 4)

P, atm.	20°	40°	60°	80°
1	1.0238	1.0483	1.0737	1.1005
500	0.9811	0.9987	1.0182	1.0400
1 000	.9494	.9651	0.9808	0.9993
1 500	.9256	.9393	.9526	.9672
2 000	.9064	.9189	.9306	.9429
2 500	.8906	.9019	.9124	.9231
3 000	.8763	.8870	.8966	.9065
3 500	.8636	.8733	.8824	.8915
4 000	.8523	.8613	.8700	.8782
4 500	.8420	.8505	.8587	.8663
5 000	.8325	.8407	.8487	.8559
6 000	.8163	.8240	.8314	.8381
7 000	.8023	.8099	.8163	.8231
8 000	.7907	.7973	.8039	.8102
9 000	.7797	.7859	.7920	.7981
10 000	.7696	.7756	.7816	.7875
11 000	.7605	.7664	.7728	.7785
12 000	.7527	.7587	.7652	.7709

P, atm.	-100°	-80°	-60°	-40°	-20°	0°
1	0.8939	0.91455	0.9352	0.9561	0.9775	1.0000
500	.8727	.8904	.9076	.92455	.9418	0.95955
1 000	.8556	.8713	.8865	.90115	.9159	.93085

C₂H₅Br, ETHYL BROMIDE (3)

P, atm.	20°	40°	60°	80°
1	1.0275	1.0578		
500	0.9776	0.9990		
1 000	.9460	.9624	0.9800	0.9988
1 500	.9216	.9358	.9492	.9626
2 000	.9022	.9151	.9268	.9381
2 500	.8857	.8981	.9088	.9187
3 000	.8714	.8830	.8931	.9020
3 500	.8590	.8697	.8791	.8873
4 000	.8479	.8577	.8666	.8742
4 500	.8380	.8469	.8554	.8625
5 000	.8289	.8372	.8453	.8519
6 000	.8131	.8206	.8276	.8339

C₂H₅Br, ETHYL BROMIDE (3).—(Continued)

P, atm.	20°	40°	60°	80°
7 000	0.7991	0.8064	0.8126	0.8189
8 000	.7868	.7937	.7995	.8056
9 000	.7756	.7820	.7879	.7935
10 000	.7656	.7715	.7775	.7825
11 000	.7568	.7623	.7685	.7730
12 000	.7495	.7546	.7606	.7648

C₂H₅Cl, ETHYL CHLORIDE (3)

P, atm.	20°	40°	60°	80°
500	0.9696	0.9931	1.0179	1.0358
1 000	.9253	.9419	0.9618	0.9797
1 500	.8964	.9107	.9268	.9411
2 000	.8749	.8874	.9010	.9128
2 500	.8569	.8680	.8800	.8904
3 000	.8415	.8515	.8623	.8715
3 500	.8283	.8375	.8475	.8557
4 000	.8167	.8253	.8346	.8422
4 500	.8061	.8143	.8230	.8302
5 000	.7965	.8045	.8125	.8194
6 000	.7796	.7870	.7944	.8008
7 000	.7654	.7726	.7795	.7856
8 000	.7533	.7602	.7666	.7728
9 000	.7423	.7488	.7549	.7611
10 000	.7320	.7382	.7442	.7501
11 000	.7228	.7283	.7344	.7397
12 000	.7148	.7192	.7255	.7301

C₂H₅I, ETHYL IODIDE (3)

P, atm.	20°	40°	60°	80°
1	1.0214	1.0438	1.0677	1.0935
500	0.9774	0.9958	1.0156	1.0351
1 000	.9475	.9640	0.9799	0.9946
1 500	.9257	.9390	.9521	.9637
2 000	.9070	.9188	.9298	.9397
2 500	.8913	.9020	.9114	.9202
3 000	.8777	.8873	.8956	.9034
3 500	.8659	.8744	.8819	.8886
4 000	.8555	.8632	.8698	.8760
4 500	.8460	.8530	.8593	.8651
5 000	.8370	.8439	.8500	.8551
6 000	.8207	.8277	.8336	.8381
7 000	.8063	.8135	.8189	.8232
8 000	.7937	.8007	.8057	.8099
9 000	.7825	.7891	.7938	.7981
10 000	.7725	.7785	.7832	.7877
11 000	.7635	.7691	.7742	.7786
12 000	.7554	.7608	.7664	.7706

C₂H₅OH, ETHYL ALCOHOL (3, 4)

P, atm.	20°	40°	60°	80°
1	1.0212	1.0438	1.0679	1.0934
500	0.9782	0.9943	1.0121	1.0319
1 000	.9479	.9608	0.9760	0.9922
1 500	.9247	.9358	.9482	.9615
2 000	.9059	.9159	.9266	.9380
2 500	.8899	.8991	.9088	.9187
3 000	.8760	.8848	.8935	.9025
3 500	.8634	.8718	.8800	.8884
4 000	.8517	.8599	.8678	.8756
4 500	.8410	.8491	.8567	.8640
5 000	.8314	.8394	.8467	.8536
6 000	.8149	.8225	.8291	.8354
7 000	.8009	.8080	.8139	.8196

C_2H_5OH , ETHYL ALCOHOL (3, 4).—(Continued)

P , atm.	20°	40°	60°	80°
8 000	0.7888	0.7953	0.8005	0.8061
9 000	.7776	.7836	.7884	.7940
10 000	.7671	.7726	.7776	.7830
11 000	.7574	.7626	.7682	.7734
12 000	.7485	.7535	.7600	.7648

P , atm.	−100°	−80°	−60°	−40°	−20°	0°
1	0.90215	0.9212	0.94035	0.9597	0.97945	1.0000
500	.8815	.89775	.91385	.92985	.9458	0.96205
1 000	.8652	.87935	.8935	.90765	.9216	.9356

 C_3H_7OH , *n*-PROPYL ALCOHOL (3)

P , atm.	20°	40°	60°	80°
1	1.0173	1.0390	1.0612	1.0865
500	0.9770	0.9936	1.0108	1.0305
1 000	.9483	.9624	0.9760	0.9913
1 500	.9280	.9396	.9513	.9634
2 000	.9124	.9222	.9322	.9424
2 500	.8991	.9079	.9167	.9258
3 000	.8876	.8957	.9039	.9120
3 500	.8773	.8849	.8925	.8999
4 000	.8677	.8752	.8824	.8893
4 500	.8588	.8664	.8732	.8796
5 000	.8507	.8582	.8647	.8706
6 000	.8365	.8436	.8495	.8548
7 000	.8243	.8308	.8365	.8414
8 000	.8138	.8196	.8249	.8301
9 000	.8043	.8096	.8148	.8203
10 000	.7958	.8010	.8058	.8114
11 000	.7883	.7931	.7976	.8031
12 000	.7814	.7858	.7899	.7952

 C_4H_9OH , ISOBUTYL ALCOHOL (3)

P , atm.	20°	40°	60°	80°
1	1.0195	1.0406	1.0625	1.0880
500	0.9740	0.9909	1.0079	1.0262
1 000	.9470	.9601	0.9740	0.9883
1 500	.9253	.9366	.9484	.9607
2 000	.9078	.9180	.9280	.9385
2 500	.8929	.9020	.9111	.9203
3 000	.8798	.8880	.8968	.9052
3 500	.8680	.8756	.8840	.8919
4 000	.8575	.8647	.8728	.8802
4 500	.8480	.8550	.8630	.8697
5 000	.8494	.8462	.8540	.8602
6 000	.8242	.8307	.8375	.8433
7 000	.8113	.8178	.8242	.8298
8 000	.8001	.8065	.8126	.8181
9 000	.7898	.7961	.8021	.8075
10 000	.7802	.7864	.7923	.7976
11 000	.7712	.7773	.7832	.7884
12 000	.7631	.7691	.7750	.7799

LITERATURE

(For a key to the periodicals see end of volume)

(1) Bridgman, 65, 47: 345; 11. (2) Bridgman, 65, 48: 309; 12. (3) Bridgman, 65, 49: 3; 13. (4) Seitz and Lechner, 8, 49: 93; 16.

 $C_5H_{11}OH$, AMYL ALCOHOL (3)

P , atm.	20°	40°	60°	80°
1	1.0181	1.0374	1.0583	1.0814
500	0.9788	0.9946	1.0108	1.0288
1 000	.9511	.9643	0.9773	0.9915
1 500	.9307	.9417	.9529	.9644
2 000	.9138	.9237	.9330	.9427
2 500	.8993	.9084	.9166	.9254
3 000	.8869	.8955	.9028	.9110
3 500	.8758	.8840	.8910	.8986
4 000	.8658	.8737	.8807	.8877
4 500	.8568	.8644	.8713	.8780
5 000	.8488	.8560	.8627	.8690
6 000	.8348	.8414	.8475	.8531
7 000	.8225	.8288	.8340	.8396
8 000	.8116	.8173	.8218	.8273
9 000	.8015	.8065	.8108	.8160
10 000	.7918	.7964	.8010	.8060
11 000	.7831	.7874	.7927	.7972
12 000	.7754	.7800	.7860	.7902

 $(C_2H_5)_2O$, ETHER (3, 4)

P , atm.	20°	40°	60°	80°
1	1.0315	1.0669		
500	0.9668	0.9884	1.0123	1.0369
1 000	.9337	.9498	0.9683	0.9874
1 500	.9070	.9195	.9336	.9484
2 000	.8850	.8952	.9069	.9189
2 500	.8663	.8756	.8860	.8962
3 000	.8503	.8594	.8688	.8776
3 500	.8366	.8454	.8539	.8620
4 000	.8246	.8329	.8407	.8481
4 500	.8139	.8218	.8292	.8360
5 000	.8044	.8121	.8189	.8252
6 000	.7883	.7953	.8017	.8070
7 000	.7743	.7806	.7865	.7917
8 000	.7613	.7670	.7725	.7779
9 000	.7492	.7545	.7597	.7652
10 000	.7380	.7431	.7482	.7535
11 000	.7275	.7325	.7377	.7427
12 000	.7178	.7225	.7280	.7326

P , atm.	−100°	−80°	−60°	−40°	−20°	0°
1	0.8750	0.8969	0.92015	0.94465	0.97105	1.0000
500	.85285	.87075	.8888	.90745	.9263	0.9464
1 000	.83565	.85085	.8660	.8812	.8964	.9126

 $(CH_3)_2CO$, ACETONE (3)

P , atm.	20°	40°	60°	80°
1	1.0279	1.0585	1.0925	
500	0.9818	1.0032	1.0282	
1 000	.9526	0.9706	0.9894	1.0082
1 500	.9286	.9441	.9594	0.9736
2 000	.9076	.9217	.9347	.9467
2 500	.8900	.9028	.9141	.9253
3 000	.8748	.8868	.8968	.9073
3 500	.8619	.8729	.8821	.8920
4 000	.8504	.8607	.8694	.8786
4 500	.8402	.8498	.8583	.8666
5 000	.8309	.8398	.8482	.8558
6 000	.8143	.8225	.8306	.8370
7 000	.7997	.8072	.8148	.8209
8 000	.7866	.7935	.8003	.8066
9 000		.7815	.7876	.7939
10 000		.7707	.7764	.7821
11 000	Freezes	.7607	.7665	.7715
12 000		.7515	.7577	.7617

DENSITY AND THERMAL EXPANSION OF CHEMICAL COMPOUNDS IN THE CRYSTALLINE STATE, UNDER ATMOSPHERIC PRESSURE

J. R. CLARKE

I. Inorganic Compounds (B-Table)

This section includes only substances for which density values reliable to four decimal places, or values over a temperature range, are available. For less accurate values at individual temperatures, *v.* Vol. I, p. 106.

Symbols and Abbreviations

The quantities recorded in the table below are the following:
 $\alpha' = \frac{10^6 dl}{l dt}$ at t° ; or $\alpha = \frac{10^6 \Delta l}{l \Delta t}$ over the range Δt° .
 $\Delta = 10^6 \frac{d\alpha}{dt}$ (resp. $10^6 \frac{\Delta \alpha}{\Delta t}$), *i.e.*, $10^6 \times$ the rate of change of α with t , at t° (resp. over Δt°).
 d_4^t = the density in g/ml at t° = the specific gravity at t° referred to H_2O at $4^\circ C$.
 d_4^0 , a , b and c , = the parameters of the equation: $d_4^t = d_4^0(1 - 10^{-5} at - 10^{-7} bt^2 - 10^{-9} ct^3)$, valid over the range indicated; b and c are zero when not given.

Arrangement

The compounds are arranged in groups, as follows: I. Oxides; II. Halogen compounds in the order, F, Cl, Br, I; III. Sulfides; IV. Sulfates; V. Nitrates; VI. Carbonates; VII. Metallo-organic compounds; VIII. Various silicates; IX. Other compounds. For organic compounds, *v.* the C-Table, p. 45.

I. OXIDES

H_2O	$d_4^0 = 0.9168 \pm 0.0005$; * For α see Fig. 1
H_2O_2	$d_4^0 = 1.6436$ (36)
As_2O_3	$d_4^0 = 3.873$, $a = 12$ (0° – 50°) (5)
Sb_2O_3 : Senarmonite	$\alpha^{40} = 41.26$, $\Delta(20^\circ$ – $70^\circ) = 67.9$ (17, 18, 33)
CO_2	$\alpha^{40} = 19.63$, $\Delta(20^\circ$ – $70^\circ) = 5.7$ (17, 18, 33)
SiO_2	$t, ^\circ C$ | -80 | -90 | -100 | -110 | -120 | -130 | -183 |
TiO_2 : Brookite.....	d_4^t | 1.565 | 1.581 | 1.594 | 1.607 | 1.618 | 1.627 | 1.665 | } (35.5)
Anatase.....	r . Vol. IV, p. 19.
Rutile.....	Values of $\alpha^{17.5}$ || a , b and c axes (a) 14.4939, (b) 19.2029, (c) 22.0489 (44)
ZrO_2	$\alpha^{40} = 8.19$ ||, = 4.68 \perp ; and $\Delta(20^\circ$ – $70^\circ) = 31.1$ ||, = 29.5 \perp to opt. axis (33); <i>cf.</i> (44)
SnO_2 : Cassiterite.....	$\alpha^{40} = 7.14$ \perp , = 9.19 ||; $\Delta(20^\circ$ – $70^\circ) = 11.0$ \perp , = 22.5 || to principal axis (17, 18, 33); <i>cf.</i> (44)
PbO_2	(36.5)
ThO_2	$\alpha^{40} = 3.2$ \perp , = 3.9 ||; $\Delta(20^\circ$ – $70^\circ) = 7.6$ \perp , = 12 || to principal axis (17, 18, 33)
ZnO : Zincite.....	$\alpha(25^\circ$ – $93^\circ) = 7.9 \pm 0.6$ (39)
Cu_2O : Cuprite.....	(36.5)
Fe_2O_3 : Hematite.....	$\alpha^{40} = 3.2$ \perp , = 3.9 ||; $\Delta(20^\circ$ – $70^\circ) = 7.6$ \perp , = 12 || to principal axis (17, 18, 33)
Fe_3O_4 : Magnetite.....	$\alpha^{40} = 0.93$, $\Delta(20^\circ$ – $70^\circ) = 21$. d_{max} . at $-43^\circ C$ (15, 16, 17, 18, 21, 22, 33); <i>cf.</i> (43)
(Fe, Zn, Mn) O.Fe ₂ O ₃ : Franklinite.....	$\alpha^{40} = 7.61$ || = 7.71 \perp ; $\Delta(5^\circ$ – $80^\circ) = 4.90$ ||, = 11.4 \perp to opt. axis. (3); <i>cf.</i> (17, 18, 33)
Al_2O_3 : Corundum.....	$\alpha^{40} = 8.46$, $\Delta = 28.9$ (14, 33)
$Al_2O_3 \cdot ZnO$: Gahnite.....	$\alpha^{40} = 8.1$, $\Delta(20^\circ$ – $70^\circ) = 9.4$ (14, 33)
$5Al_2O_3 \cdot 2FeO \cdot 4SiO_2$	$\alpha^{40} = 6.2$ ||; = 5.4 \perp ; and $\Delta(20^\circ$ – $70^\circ) = 20.5$ ||; = 22.5 \perp to principal axis. (14, 15, 16, 33); <i>cf.</i> (Vol. II, p. 87)
H_2O : Staurolite.....	$\alpha^{40} = 5.95$, $\Delta(20^\circ$ – $70^\circ) = 18.3$ (14, 15, 16, 33)
	$\alpha^{40} = 7.08$, $\Delta = 31.5$ (14)

* Estimate by Howard T. Barnes on basis of critical examination of all available data. For discussion and bibliography see (3.5) and his forthcoming book on *The Physics of Ice*.

(Zn, Fe)O.(Al, Fe) ₂ O ₃ : Kreittonite.....	$\alpha^{40} = 5.96$, $\Delta(20^\circ$ – $70^\circ) = 19.4$ (15, 16, 33)
$Al_2O_3 \cdot BeO$: Chrysoberyl.....	|| α' -axis | α'' -axis | α''' -axis† | Lit.
	α^{40} | 5.16 | 6.01 | 6.02 | (14)
	Δ | 12.2 | 10.1 | 22.0 | (33)
MgO	(Prefused) $\alpha = 11.40 + 9.2(t - 120)$, 120° to 270° (24)
Periclase.....	$\alpha^{40} = 10.43$, $\Delta(20^\circ$ – $70^\circ) = 26.7$ (15, 16, 33)
$MgO \cdot Al_2O_3$: Spinel.....	$\alpha^{40} = 5.93$, $\Delta(20^\circ$ – $70^\circ) = 19.5$ (15, 16, 33)
(Mg, Fe)O. Al_2O_3 : Pleonaste.....	$\alpha^{40} = 6.03$, $\Delta(20^\circ$ – $70^\circ) = 19.7$ (15, 16, 33)

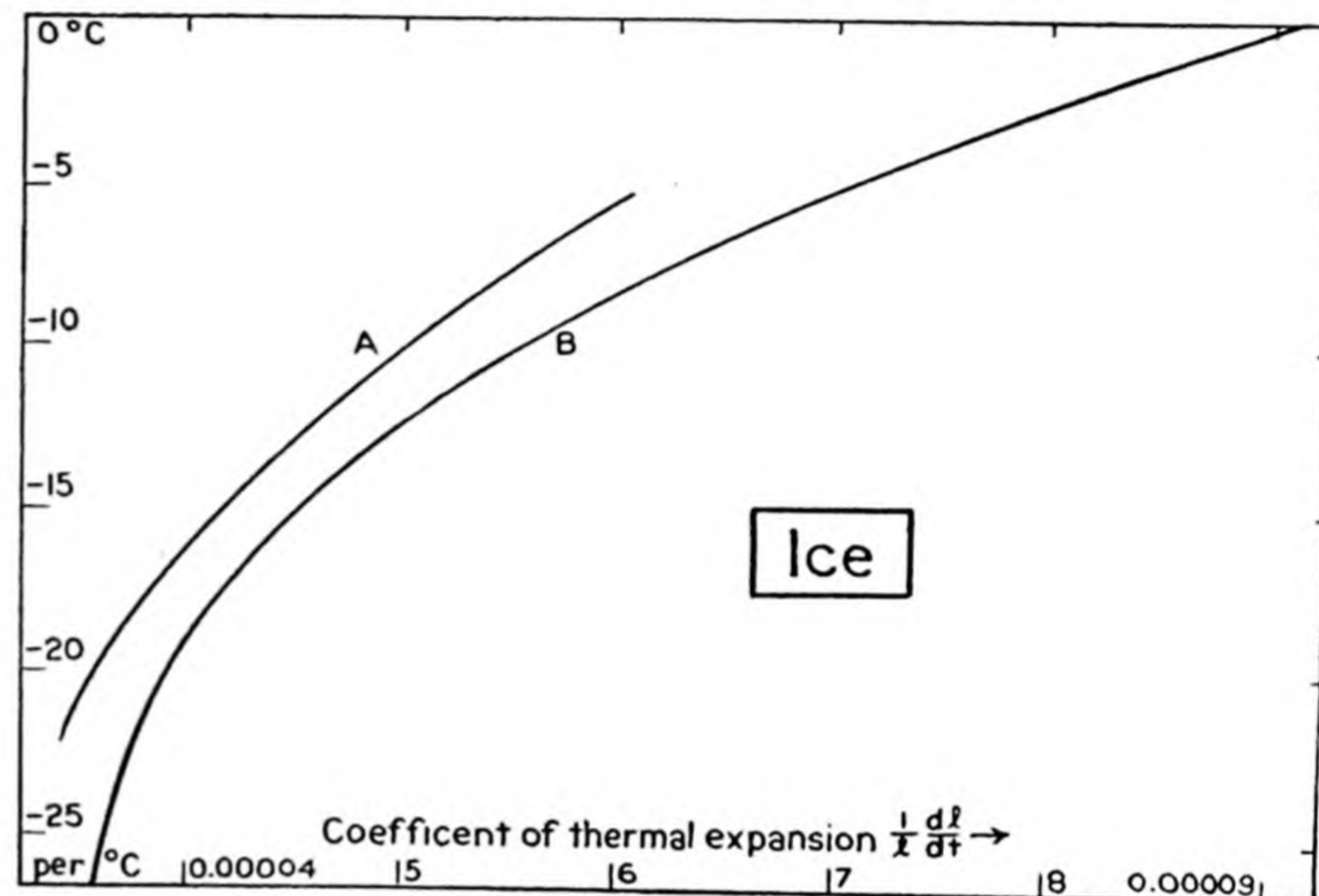


FIG. 1.—Curve A from Sawyer(43.5). Curve B from Andrews(2.5).

II. HALOGEN COMPOUNDS

CaF ₂ : Fluorite (54, 55)	$T, ^\circ K$	α	$\alpha(50^\circ-60^\circ) = 5.734$ (40)
	265.7	18.53	$\alpha^{52} = 19.34$ (56)
	255.6	17.58	$\alpha^{40} = 19.11$ and $\Delta(20^\circ-70^\circ) = 28.8$
	231.4	16.78	(21, 22, 33)
	209.8	16.04	
	186.9	14.65	
	156.3	13.02	
	124.9	10.26	
	94.4	7.17	
NH ₄ Cl.....	$d_4^{20} = 1.5256$ (26). $\alpha^{40} = 62.55$ and $\Delta(20^\circ-70^\circ) = 297.5$ (19, 20, 33)		
PbCl ₂	(Prefused) $d_4^0 = 5.899$, $a = 8.8$ ($0^\circ-50^\circ$) (5); <i>cf.</i> (47)		
AgCl.....	$\alpha^{40} = 32.94$, $\Delta(20^\circ-70^\circ) = 122.3$ (19, 20, 33)		
PrCl ₃	$d_4^{25} = 4.0203$ (5)		
MgCl ₂ ·6H ₂ O.....	$d_4^4 = 1.5907$ (28)		
CaCl ₂ ·6H ₂ O.....	$d_4^4 = 1.7182$ (28)		
CaCl ₂ ·2MgCl ₂ ·6H ₂ O.....	$d_4^4 = 1.6655$ (28)		
LiCl.....	$d_4^{20} = 2.0678$ (26)		
NaCl.....	$d_4^0 = 2.1680$, $a = 11.2$, $b = 0.5$ (-184° to 50°) (6, 7, 12, 27, 45); <i>cf.</i> (19, 20, 33, 40); $\alpha(20^\circ$ to $80^\circ K) = 10.8$ (34)		
KCl.....	$d_4^0 = 1.9920$, $a = 10.5$, $b = 0.4$ (-184° to 70°) (27); <i>cf.</i> (19, 20, 33, 40). $d_4^{30} = 1.9786$ (large crys.) = 1.9841 (small crys.) (29, 30)		
RbCl.....	$d_4^0 = 2.8057$, $a = 12.6$, $b = -6$ ($0^\circ-50^\circ$) (6)		
CsCl.....	$d_4^0 = 3.9887$, $a = 15.9$, $b = -4$ ($0^\circ-70^\circ$) (6)		
KClO ₃	$d_4^0 = 2.3467$, $a = 18$, $b = -3$ ($0^\circ-44^\circ$) (2)		
LiClO ₄	$d_4^{25} = 2.4284$ (42)		
PbBr ₂	$d_4^0 = 6.676$, $a = 9.5$, ($0^\circ-50^\circ$) (5)		
AgBr.....	$\alpha^{40} = 34.7$, $\Delta(20^\circ-70^\circ) = 38.3$ (19, 20, 33)		
CaBr ₂	$d_4^{20} = 3.3535$ (41)		
NaBr.....	$d_4^0 = 3.213$, $a = 12$, $b = 0.3$ (-184° to 50°) (6, 27)		

† α' along bisector of acute angle, α'' along bisector of obtuse angle formed by optic axes, α''' along the normal to the plane of optic axes.

KBr.....	$d_4^0 = 2.756$, $a = 11.4$, $b = 0.45$ (-184° to 50°) (6, 27), cf. (19, 20, 33)
RbBr.....	$d_4^0 = 3.358$, $a = 11$ (0° - 50°) (6)
CsBr.....	$d_4^0 = 4.449$, $a = 14$ (0° - 50°) (6)
PbI ₂	$\alpha^{40} = 33.6$, $\Delta(20^\circ$ - $70^\circ) = 58.4$ (19, 20)
CdI ₂	$\alpha^{40} = 29.16$, $\Delta(20^\circ$ - $70^\circ) = 175$ (19, 20)
HgI ₂	$\alpha^{40} = 2.39$, $\Delta(20^\circ$ - $70^\circ) = 200$ (19, 20)
AgI.....	$\alpha^{40} = -3.97$ ||; $= 0.65$ ⊥; and $\Delta = -42.7$ ||; $= 13.8$ ⊥ principal axis (19, 20, 31, 33)
NaI.....	$d_4^0 = 3.665$, $a = 13.55$ (0° - 50°) (4, 6) $d_4^0 = 3.6587$, $a = 14.1$, $b = 2.1$ (-184° to 0°) (27); $a = 12.7$ (-79° to 0°) (27)
KI.....	$d_4^0 = 3.133$, $a = 12.6$, $b = -2.5$ (0° - 50°) (6) $d_4^0 = 3.1265$, $a = 12.7$, $b = 0.4$ (-184° to 20°) (27); $a = 11.5$ (-79° to 0°) (27) $\alpha^{40} = 42.65$, $\Delta(20^\circ$ - $70^\circ) = 167.6$ (19, 20, 33)
RbI.....	$d_4^0 = 3.560$, $a = 12$, $b = -4.5$ (0° - 50°) (6)
CsI.....	$d_4^0 = 4.525$, $a = 14.6$ (0° - 50°) (6)

III. SULFIDES

III. SULFIDES

Sb ₂ S ₃ : Stibnite.....	$\alpha^{40} = 1.53, \Delta(20^\circ-70^\circ) = 21.9$ (14)														
CS ₂	$d_4^{115.7} = 1.5539$ (32)														
PbS: Galena.....	$\alpha^{40} = 20.14, \Delta(20^\circ-70^\circ) = 5.4$ (21, 22, 33)														
ZnS: Sphalerite.....	$\alpha^{40} = 6.70, \Delta(20^\circ-70^\circ) = 12.8$ (9, 33)														
HgS: Cinnabarite.	$\alpha^{40} = 21.5 \parallel; \Delta(20^\circ-70^\circ) = 15$ and $\alpha^{40} = 17.9 \perp; \Delta = 6.3$ (9, 33)														
	Red sublimed: $d_4^t = 8.203, a = 42, b = -33$ ($16^\circ-78^\circ$) (46)														
	Black sublimed: $d_4^{17} = 8.0395$ (46)														
3Ag ₂ S.Sb ₂ S ₃ : Pyrargyrite.....	$\alpha^{40} = 0.91 \parallel; \Delta(20^\circ-70^\circ) = 105$ and $\alpha^{40} = 20.1, \perp; \Delta = -23.1$ (14, 33)														
MnS: Alabandite...	$\alpha^{40} = 15.2, \Delta(20^\circ-70^\circ) = 21.7$ (14, 33)														
MnS ₂ : Hauerite.....	$\alpha^{40} = 11.1, \Delta(20^\circ-70^\circ) = 88.9$ (14, 33)														
FeS ₂ : Pyrite (54, 55)	<table> <tr> <th>°K</th><td>268.7</td><td>237.4</td><td>214.8</td><td>155.0</td><td>129.7</td><td>108.0</td></tr> <tr> <th>α</th><td>8.43</td><td>7.73</td><td>7.09</td><td>5.16</td><td>3.92</td><td>2.95</td></tr> </table>	°K	268.7	237.4	214.8	155.0	129.7	108.0	α	8.43	7.73	7.09	5.16	3.92	2.95
	°K	268.7	237.4	214.8	155.0	129.7	108.0								
α	8.43	7.73	7.09	5.16	3.92	2.95									
	Also, $\alpha^{40} = 9.1$ and $\Delta(20^\circ-70^\circ) = 18$ (21, 22, 33)														
Pyrrhotite: Fe ₉ S ₈ to Fe ₁₆ S ₁₇	<table> <tr> <th>α^{40}</th><th>$\Delta(20^\circ-70^\circ)$</th><th>Lit.</th></tr> <tr> <td>2.35 \parallel</td><td>86.4 \parallel</td><td></td></tr> <tr> <td>31.20 \perp</td><td>-16.5 \perp</td><td>(14, 33)</td></tr> </table>	α^{40}	$\Delta(20^\circ-70^\circ)$	Lit.	2.35 \parallel	86.4 \parallel		31.20 \perp	-16.5 \perp	(14, 33)					
	α^{40}	$\Delta(20^\circ-70^\circ)$	Lit.												
2.35 \parallel	86.4 \parallel														
31.20 \perp	-16.5 \perp	(14, 33)													
CuFeS ₂ : Chalcopyrite.....	$\alpha^{40} = 17.1, \Delta(20^\circ-70^\circ) = 17$ (14)														
NiS ₂ .NiSb ₂ : Ullmannite.....	$\alpha^{40} = 11.12, \Delta(20^\circ-70^\circ) = -1.5$ (14, 33)														
(Fe, Co, Ni)S ₂ (Co-Ni-pyrite): Kobaltnickelkies..	$\alpha^{40} = 10.4, \Delta(20^\circ-70^\circ) = 15.9$ (14, 33)														
5Cu ₂ S.2(Cu, Fe)- S.2Sb ₂ O ₃ : Tetrahedrite	Three samples (14, 33): $\alpha^{40} = 9.22 \quad 8.71 \quad 7.32$ $\Delta(20^\circ-70^\circ) = 20.7 \quad 22.5 \quad 23.4$														

IV. SULFATES

(NH ₄) ₂ SO ₄	$d_4^{30} = 1.7637$ (29) = 1.7716 (52) = 1.7681 (50)								
Sb ₂ (SO ₄) ₃	$d_4^t = 3.6246$ (37)								
(NH ₄) ₂ Sb ₂ (SO ₄) ₄	$d_4^t = 3.0948$ (37)								
ZnSO ₄	$d_4^{16.2} = 1.9661$ (1)								
CuSO ₄ .5H ₂ O.....	$d_4^t = 2.2895$, $a = 9.6$ (15° - 45°) (1)								
MnSO ₄ .5H ₂ O.....	$d_4^{14.5} = 2.1996$ (1)								
FeSO ₄ .7H ₂ O.....	$d_4^{14.4} = 1.8988$, $d_4^{37.6} = 1.8959$ (1)								
MgSO ₄ .7H ₂ O.....	$d_4^t = 1.6812$, $a = 12$ (14° - 32°) (1, 2)								
CaSO ₄ .2H ₂ O: Gypsum.....	$\alpha_1^{40} = 41.63$ with $\Delta(20^\circ$ - $70^\circ) = 93.6$ b-axis $\alpha_2^{40} = 1.57$, $\alpha_3^{40} = 29.33$ to the other two axes of the thermal ellipsoid (21, 22)								
SrSO ₄	$\alpha^{40} = 52.62$, $\Delta(20^\circ$ - $70^\circ) = 34.5$ (14)								
BaSO ₄ : Barite.....	$\alpha^{40} = 54.18$, $\Delta(20^\circ$ - $70^\circ) = 28.5$ (14) $d_4^{15} = 4.4662$ (10)								
Na ₂ SO ₄ .10H ₂ O.....	$d_4^t = 1.4697$, $a = 14$, $b = -15$ (0° - 24°) (2)								
Na ₂ Sb ₂ (SO ₄) ₄	$d_4^t = 3.2298$ (37)								
K ₂ SO ₄	$d_4^{30} = 2.6563$ (large crys.); $= 2.6574$ (small crys.) (29, 30) $d_4^t = 2.6673$, $a = 10.5$, $b = 0.7$ (20° - 60°) (1, 2)								
	<table border="1"> <tr> <th></th><th>$\alpha(0^\circ$ to $96^\circ)$ (48, 49)</th></tr> <tr> <td>a-axis</td><td>36.16 + 0.0144t</td></tr> <tr> <td>b-axis</td><td>32.25 + 0.0141t</td></tr> <tr> <td>c-axis</td><td>36.34 + 0.0413t</td></tr> </table>		$\alpha(0^\circ$ to $96^\circ)$ (48, 49)	a-axis	36.16 + 0.0144t	b-axis	32.25 + 0.0141t	c-axis	36.34 + 0.0413t
	$\alpha(0^\circ$ to $96^\circ)$ (48, 49)								
a-axis	36.16 + 0.0144t								
b-axis	32.25 + 0.0141t								
c-axis	36.34 + 0.0413t								

K ₂ Sb ₂ (SO ₄) ₄	$d_4^t = 3.3396$ (37)						
K ₂ Zn(SO ₄) ₂ .6H ₂ O...	$d_4^{20} = 2.2458$ (51)						
KAl(SO ₄) ₂ .12H ₂ O...	Alum. $d_4^t = 1.7541$, $a = 3.8$ (13° - 56°) (1)						
K ₂ Mg(SO ₄) ₂ .6H ₂ O...	$d_4^{20} = 2.0337$ (51)						
	Values of α (0° to 96°), the three axes (48, 49)						
Rb ₂ SO ₄	<table border="1"> <tr> <td>a-axis</td><td>33.85 + 0.0214t</td></tr> <tr> <td>b-axis</td><td>31.95 + 0.0182t</td></tr> <tr> <td>c-axis</td><td>35.90 + 0.0414t</td></tr> </table>	a-axis	33.85 + 0.0214t	b-axis	31.95 + 0.0182t	c-axis	35.90 + 0.0414t
a-axis	33.85 + 0.0214t						
b-axis	31.95 + 0.0182t						
c-axis	35.90 + 0.0414t						
Rb ₂ Zn(SO ₄) ₂ .6H ₂ O...	$d_4^{20} = 2.5905$ (51)						
Rb ₂ Mg(SO ₄) ₂ .6H ₂ O...	$d_4^{20} = 2.3859$ (51)						
Cs ₂ Zn(SO ₄) ₂ .6H ₂ O...	$d_4^{20} = 2.8753$ (51)						
Cs ₂ Mg(SO ₄) ₂ .6H ₂ O...	$d_4^{20} = 2.6760$ (51)						

V. NITRATES

	Values for three crystal forms (8)					
	Form	$t_{Tr.}$	d_0^t	a	b	Range
TiNO ₃	I	73°	5.5767	17.3	4.2	0°-70°
	II		5.5393	11.6	5.5	81°-142°
	III		5.5812	35.3	-0.48	144°-200°
AgNO ₃ : Prefused...	$\alpha(20^\circ \text{ to } 150^\circ) = 77$ (25)					
LiNO ₃	$d_4^{20} = 2.3658$ (26)					
NaNO ₃	$d_4^0 = 2.2663$, a = 12 (0°-45°) (2)					
KNO ₃	$d_4^0 = 2.1126$, a = 18.1, b = 2.56 (0°-50°) (2)	} $t_{Tr.}$ at 127.8°C				
	$d_4^0 = 2.1106$, a = 18.1, b = 2.56 (0°-122°) (8)					
	$d_4^0 = 2.1106$, a = 28.06 (130°-155°) (8)					
RbNO ₃	$d_4^{20} = 3.1119$ (26)	} $t_{Tr.} = 161.4^\circ\text{C}$				
	$d_4^0 = 3.1063$, a = 19.3, b = 2.58, c = -0.5 (0°-158°)					
	Form II, $d_4^0 = 3.0979$, a = 27.5, b = 2.23 (164°-219°) (8)					
CsNO ₃	$d_4^{20} = 3.6432$ (26)	} $t_{Tr.} = 151^\circ\text{C}$				
	$d_4^0 = 3.6524$, a = 20.5, b = -2.1, c = 1.62 (0°-134°)					
	Form II, $d_4^0 = 3.6479$, a = 28 (151°-172°) (8)					

VI. CARBONATES

2CuCO ₃ .Cu(OH) ₂ : Azurite.....	$\alpha_1^{40} = 12.59$ with $\Delta(20^\circ$ - $70^\circ) = 20.3$ $\alpha_2^{40} = 20.8$; $\alpha_3^{40} = -0.98$ (21, 22, 23)*				
FeCO ₃ : Siderite...	$\alpha^{40} = 19.2$ with $\Delta(20^\circ$ - $70^\circ) = 25.5$; and $\alpha^{40} = 6.05$ with $\Delta(20^\circ$ - $70^\circ) = 917$ ⊥ (14, 33)				
MgCO ₃ : Magnesite	$\alpha^{40} = 21.3$ with $\Delta(20^\circ$ - $70^\circ) = 33.9$; and $\alpha^{40} = 5.99$ with $\Delta(20^\circ$ - $70^\circ) = 24.3$ ⊥ (14, 33)				
CaCO ₃ : Calcite...	<table border="1"> <tr> <td>$d_4^0 = 2.7710$, $d_4^{20} = 2.7102$ (12)</td><td rowspan="3">$\alpha(2^\circ$ to $81^\circ) = 25.1353 + 0.0118t$, opt. axis; and $= -5.5782 + 0.00138t$, ⊥ opt. axis (9)</td></tr> <tr> <td>$\alpha^{40} = 26.21 + 0.0160(t - 40)$, opt. axis; and $= -5.40 + 0.0087(t - 40)$, ⊥ opt. axis (21, 22, 23)</td></tr> <tr> <td>$a(50^\circ$ to $60^\circ) = 1.447$ (40)</td></tr> </table>	$d_4^0 = 2.7710$, $d_4^{20} = 2.7102$ (12)	$\alpha(2^\circ$ to $81^\circ) = 25.1353 + 0.0118t$, opt. axis; and $= -5.5782 + 0.00138t$, ⊥ opt. axis (9)	$\alpha^{40} = 26.21 + 0.0160(t - 40)$, opt. axis; and $= -5.40 + 0.0087(t - 40)$, ⊥ opt. axis (21, 22, 23)	$a(50^\circ$ to $60^\circ) = 1.447$ (40)
$d_4^0 = 2.7710$, $d_4^{20} = 2.7102$ (12)	$\alpha(2^\circ$ to $81^\circ) = 25.1353 + 0.0118t$, opt. axis; and $= -5.5782 + 0.00138t$, ⊥ opt. axis (9)				
$\alpha^{40} = 26.21 + 0.0160(t - 40)$, opt. axis; and $= -5.40 + 0.0087(t - 40)$, ⊥ opt. axis (21, 22, 23)					
$a(50^\circ$ to $60^\circ) = 1.447$ (40)					
CaCO ₃ : Aragonite.	<table border="1"> <tr> <td>$\alpha_1^{40} = 34.60 + 0.0337t$</td><td rowspan="3">$\alpha(20^\circ$-$70^\circ) = 25.1353 + 0.0118t$, opt. axis; and $= -5.5782 + 0.00138t$, ⊥ opt. axis (9)</td></tr> <tr> <td>$\alpha_2^{40} = 17.19 + 0.0368t$</td></tr> <tr> <td>$\alpha_3^{40} = 10.16 + 0.0064t$</td></tr> </table>	$\alpha_1^{40} = 34.60 + 0.0337t$	$\alpha(20^\circ$ - $70^\circ) = 25.1353 + 0.0118t$, opt. axis; and $= -5.5782 + 0.00138t$, ⊥ opt. axis (9)	$\alpha_2^{40} = 17.19 + 0.0368t$	$\alpha_3^{40} = 10.16 + 0.0064t$
$\alpha_1^{40} = 34.60 + 0.0337t$	$\alpha(20^\circ$ - $70^\circ) = 25.1353 + 0.0118t$, opt. axis; and $= -5.5782 + 0.00138t$, ⊥ opt. axis (9)				
$\alpha_2^{40} = 17.19 + 0.0368t$					
$\alpha_3^{40} = 10.16 + 0.0064t$					
CaMg(CO ₃) ₂ : Dolomite.....	$\alpha^{40} = 20.60$ with $\Delta(20^\circ$ - $70^\circ) = 36.8$ $\alpha^{40} = 4.15$ with $\Delta(20^\circ$ - $70^\circ) = 19.3$ ⊥ (33)				
K ₂ CO ₃	$d_4^{15} = 2.3296$ (10)				

VII. METALLO-ORGANIC COMPOUNDS

Sn(C ₆ H ₅) ₄	$d_4^t = 1.4922$, $a = 20$, (5° - 38°) (11)
Sn ₂ (C ₆ H ₅) ₆	$d_4^{13.9} = 1.5147$, $d_4^{35.7} = 1.5098$ (11)
Sn ₅ (C ₆ H ₅) ₁₂	$d_4^{22.8} = 1.6088$, $d_4^{44.1} = 1.5967$ (11)
ISn(C ₆ H ₅) ₃	$d_4^{30.0} = 1.7617$, $d_4^{1.6} = 1.7665$ (11)
KNaC ₄ H ₄ O ₆ .4H ₂ O: Rochelle salt.....	-10° to $+20^\circ$: $\alpha_1 = 59.9$, $\alpha_2 = 38.1$, $\alpha_3 = 44.8$ (53)

VIII. VARIOUS SILICATES

ZrSiO ₄ : Zircon....	$\alpha^{40} = 4.43$ with $\Delta(20^\circ-70^\circ) = 14.1 \parallel$ $\alpha^{40} = 2.33$ with $\Delta(20^\circ-70^\circ) = 19.1 \perp (21, 22, 33)$				
(AlF) ₂ SiO ₄ : Topaz		α_1	α_2	α_3^\dagger	Lit.
	α^{40}	5.92	4.84	4.44	(9, 21, 22, 33)
	$\Delta(20^\circ-70^\circ)$	18.3	15.3	16.8	
3MnO.Al ₂ O ₃ .3SiO ₂ : Spessartite.....	$\alpha^{40} = 8.24, \Delta(20^\circ-70^\circ) = 21.4 (33)$				

3FeO.Al ₂ O ₃ .3SiO ₂ : Almandite.....	$\alpha^{40} = 8.37, \Delta(20^\circ-70^\circ) = 18.0$ (33)																
HNaAl ₃ BSi ₂ O ₁₁ : Tourmaline....	6° to 320°: opt. axis, $\alpha = 8.624, \Delta(20^\circ-70^\circ) = 5.625$; ⊥ opt. axis, $\alpha = 3.583, \Delta(20^\circ-70^\circ) = 4.490$ (35) $\alpha^{40} = 9.05$, with $\Delta(20^\circ-70^\circ) = 32.0$ $\alpha^{40} = 3.79$, with $\Delta(20^\circ-70^\circ) = 18.3$ ⊥ (33)																
2BeO.SiO ₂ : Phenacite.....	<table> <tr> <td>α^{40}</td><td>3.79 </td><td>2.99 ⊥</td><td rowspan="2">} (14)</td></tr> <tr> <td>$\Delta(20^\circ-70^\circ)$</td><td>21.3 </td><td>23.0 ⊥</td></tr> </table>	α^{40}	3.79	2.99 ⊥	} (14)	$\Delta(20^\circ-70^\circ)$	21.3	23.0 ⊥									
α^{40}	3.79	2.99 ⊥	} (14)														
$\Delta(20^\circ-70^\circ)$	21.3	23.0 ⊥															
Be ₃ Al ₂ (SiO ₃) ₆ : Beryl.....	opt. axis, $\alpha^{40} = -1.348, \Delta(2^\circ-80^\circ) = 4.12$ ⊥ opt. axis, $\alpha^{40} = 1.0025, \Delta(2^\circ-80^\circ) = 4.57$ $\alpha^{40} = -1.06$; $= 1.37$ ⊥ (15, 16, 21, 22, 33)																
MgAl ₂ (SiO ₄) ₃ : Pyrope.....	$\alpha^{40} = 8.27, \Delta(20^\circ-70^\circ) = 21.0$ (33)																
3CaO.Fe ₂ O ₃ .3SiO ₂ : Melanite } Aplome } Andradite	<table> <tr> <td>α^{40}</td><td>7.34</td><td>7.36</td><td rowspan="2">} 2 specimens</td><td rowspan="2">(33)</td></tr> <tr> <td>$\Delta(20^\circ-70^\circ)$</td><td>14.3</td><td>17.4</td></tr> <tr> <td>α^{40}</td><td>7.43</td><td>7.45</td><td rowspan="2">} 2 specimens</td><td rowspan="2">(33)</td></tr> <tr> <td>$\Delta(20^\circ-70^\circ)$</td><td>7.0</td><td>17.8</td></tr> </table>	α^{40}	7.34	7.36	} 2 specimens	(33)	$\Delta(20^\circ-70^\circ)$	14.3	17.4	α^{40}	7.43	7.45	} 2 specimens	(33)	$\Delta(20^\circ-70^\circ)$	7.0	17.8
α^{40}	7.34	7.36	} 2 specimens	(33)													
$\Delta(20^\circ-70^\circ)$	14.3	17.4															
α^{40}	7.43	7.45	} 2 specimens	(33)													
$\Delta(20^\circ-70^\circ)$	7.0	17.8															
3CaO.Al ₂ O ₃ .3SiO ₂ : Grossularite....	<table> <tr> <td>α^{40}</td><td>6.93</td><td>6.93</td><td>6.84</td><td rowspan="2">} 3 specimens</td><td rowspan="2">(33)</td></tr> <tr> <td>$\Delta(20^\circ-70^\circ)$</td><td>18.7</td><td>16.0</td><td>16.0</td></tr> </table>	α^{40}	6.93	6.93	6.84	} 3 specimens	(33)	$\Delta(20^\circ-70^\circ)$	18.7	16.0	16.0						
α^{40}	6.93	6.93	6.84	} 3 specimens	(33)												
$\Delta(20^\circ-70^\circ)$	18.7	16.0	16.0														
Ca ₆ (AlOHF)Al ₂ (SiO ₄) ₃ : Vesuvianite....	<table> <tr> <td>α^{40}</td><td>7.40 </td><td>8.39 ⊥</td><td rowspan="2">} (9, 33)</td></tr> <tr> <td>$\Delta(20^\circ-70^\circ)$</td><td>17.4 </td><td>16.7 ⊥</td></tr> </table>	α^{40}	7.40	8.39 ⊥	} (9, 33)	$\Delta(20^\circ-70^\circ)$	17.4	16.7 ⊥									
α^{40}	7.40	8.39 ⊥	} (9, 33)														
$\Delta(20^\circ-70^\circ)$	17.4	16.7 ⊥															
HCa ₂ (Al, Fe) ₃ Si ₃ O ₁₃ : Epidote.....	α_1^{40} b-axis = 9.13, $\Delta(20^\circ-70^\circ) = 25.5$ (21, 22, 33)* $\alpha_2^{40} = 3.34; \alpha_3^{40} = 10.86$																
KAlSi ₃ O ₈ : Adularia.....	$\alpha_1^{40} = -2.01, \Delta(20^\circ-70^\circ) = 13$ (21, 22, 33) $\alpha_2^{40} = 19.06; \alpha_3^{40} = -1.50$																

IX. OTHER COMPOUNDS

CoAs ₂ : Smaltite.....	$\alpha^{40} = 9.19, \Delta(20^\circ-70^\circ) = 16.4$ (9, 33)
CoS ₂ CoAs ₂ : Cobaltite.....	$\alpha^{40} = 9.19, \Delta(20^\circ-70^\circ) = 17.0$ (9, 33)

* α_1 along b-axis, α_2, α_3 along other two axes of the thermal ellipsoid.

† α_1 along bisector of acute <; α_2 along bisector of obtuse <; α_3 along normal to plane containing optic axes.

(NH ₄) ₂ Cr ₂ O ₇	$d_4^{25} = 2.1600$ (38)
6MgO.MgCl ₂ :-	
8B ₂ O ₃ : Boracite....	$\alpha^{40} = 3.91, \Delta(20^\circ-70^\circ) = 16.9$ (14, 33)
K ₂ CrO ₄	$d_4^{18.6} = 2.7320, d_4^{56.6} = 2.7216$ (1)
SiC: Carborundum.	$l_t = l_0(1 + 2.118 \times 10^{-6}t + 2.741 \times 10^{-9}t^2)$ (10°-412°) (57)

LITERATURE

(For a key to the periodicals see end of volume)

- (1) Andreae, 7, 76: 491; 11. (2) Andreae, 7, 82: 109; 13. (3) Bäckström, 388, 51: 545; 94. (3.5) Barnes, 69, 3 III: 3; 09. (4) Baxter and Brink, 1, 30: 46; 08. (5) Baxter and Hawkins, 1, 38: 266; 16. (6) Baxter and Wallace, 1, 38: 259; 16. (7) Bedson and Williams, 25, 14: 2556; 81. (8) Bellati and Finazzi, 24, 69 II: 1151; 10. (9) Benoît, 238, 6; 88. (10) Berkeley, 4, 91: 56; 07. (11) Böseken and Rutgers, 70, 42: 1017; 23. (12) DeFoe and Compton, 2, 25: 618; 25. (13) Ditte, 34, 85: 1069; 77. (14) Fizeau, *Annuaire pour l'an 1888* (Paris, Bureau des longitudes). (15) Fizeau, 8, 126: 611; 65. (16) Fizeau, 34, 60: 1161; 65. (17) Fizeau, 8, 128: 564; 66. (18) Fizeau, 34, 62: 1101, 1133; 66. (19) Fizeau, 8, 132: 292; 67. (20) Fizeau, 34, 64: 314; 771; 67. (21) Fizeau, 8, 135: 372; 68. (22) Fizeau, 34, 66: 1005, 1072; 68. (23) Geiss, 8, 76: 403; 25. (24) Goodwin and Mailey, 78, 9: 89; 06. (25) Guinchant, 34, 149: 569; 09. (26) Haigh, 1, 34: 1137; 12. (27) Henglein, 7, 115: 91; 25. (28) van't Hoff, Kenrick and Dawson, 7, 39: 27; 01. (29) Johnston and Adams, 1, 34: 563; 12. (30) Johnston and Adams, 93, 76: 274; 12. (31) Jones, 1, 31: 191; 09. (32) Körber, 8, 37: 1014; 12. (33) Liebisch, *Physikalische Kristallographie*, p. 92 (Leipzig, Veit) 1891. (34) Lindemann, 63, 13: 737; 12. (35) Lindman, 426, 46: No. 6; 16. 427, 2: 709; 21. (35.5) Maass and Barnes, 5, 111: 224; 26. (36) Maass and Hatcher, 1, 42: 2548; 20. (36.5) Merritt, 78, 50: Preprint; 26. (37) Metzl, 93, 48: 140; 06. (38) Moles and González, 132, 21: 204; 23. (39) Palmaer, 9, 29: 415; 23. (40) Pulfrich, 8, 45: 609; 92. (41) Richards and Hönigschmid, 1, 32: 1577; 10. (42) Richards and Willard, 1, 32: 4; 10. (43) Röntgen, 213, 1912: 381. (44) Schrauf, 94, 9: 433; 84. (45) Spangenberg, 94, 57: 494; 23. (46) Spring, 93, 7: 371; 94. (47) Timofejew, 7, 78: 299; 11. (48) Tutton, 62, 192: 455; 99. (49) Tutton, 94, 31: 426; 99. (50) Tutton, 94, 38: 602; 04. (51) Tutton, 94, 41: 321; 05. (52) Tutton, 94, 41: 381; 05. (53) Valasek, 2, 20: 639; 22. (54) Valentiner and Wallot, 88, 16: 757; 14. (55) Valentiner and Wallot, 8, 46: 837; 15. (56) Weidmann, 8, 38: 453; 89. (57) Weigel, 188, 1915: 309.

DENSITY AND THERMAL EXPANSION OF ORGANIC COMPOUNDS IN THE CRYSTALLINE STATE

J. S. CLARK

This section includes only substances for which density values reliable to four decimals or values over a temperature range are available. For less accurate values at individual temperatures v. Vol. I, p. 176.

C-TABLE

Formula	Name	M. P., °C	d_4^t	t, °C	Lit.
CHI ₃	Iodoform.....		4.4459	-188	(1)
			4.1955	+ 17	(1)
CH ₄ N ₂ O	Urea.....		1.3617	-188	(1)
			1.3190	+ 17	(1)
CH ₃ O	Methyl alcohol.....	- 94.9	0.9673	- 94.9	(3)
C ₂ H ₃ Cl ₃ O ₂	Chloral hydrate.....		1.9744	-188	(1)
			1.9151	+ 17	(1)
C ₂ H ₅ Br	Ethyl bromide.....	-125.5	1.8832	-125.5	(3)
C ₂ H ₅ I	Ethyl iodide.....	-118	2.4046	-118	(3)
C ₂ H ₂ O ₄	Oxalic acid dihydrate.....		1.7024	-188	(1)
			1.6145	+ 17	(1)
C ₃ H ₆ O	Acetone.....	- 99	0.9686	- 99	(3)
C ₄ H ₆ O ₄	Dimethyl oxalate.....		1.5278	-188	(1)
			1.4260	+ 17	(1)
C ₄ H ₁₀ O	Ethyl ether.....	-117.6	0.9212	-117.6	(3)
C ₆ H ₅ NO ₂	Nitrobenzene.....	8.7	1.2229	0.0	(8)
C ₆ H ₁₂ O ₅	Quercitol.....	225	1.5845	13	(7)
C ₆ H ₁₂ O ₆	Glucose.....		1.5620	18	(9)
			1.4084	17.5	(5)
C ₈ H ₆ O ₂	Phthalide (stable form).....		1.4051	30.0	(5)
			1.3990	44.1	(5)

Formula	Name	M. P., °C	d_4^t	t, °C	Lit.
C ₈ H ₁₆ O ₂	Octoic acid.....	16.2	1.0326	10	(2)
			1.0274	15	(2)
C ₉ H ₁₈ O ₂	Nonoic acid.....	12.3	0.9952	5	(2)
			0.9916	10	(2)
C ₁₀ H ₈	Naphthalene.....		1.2355	-188	(1)
			1.1589	+ 17	(1)
C ₁₀ H ₁₄ O	Thymol.....	51.5	0.9689	24.4	(6)
C ₁₀ H ₂₀ O ₂	n-Capric acid.....	31.2	1.0266	15	(2)
			1.0176	25	(2)
			1.0431	0.12	(2)
C ₁₁ H ₂₂ O ₂	Undecylic acid.....	28.25	1.0373	10	(2)
			0.9948	20	(2)
			0.9905	25	(2)
C ₁₂ H ₂₂ O ₁₁	Sucrose.....		1.5877	18	(9)
C ₁₂ H ₂₄ O ₂	Lauric acid.....	43.75	1.0099	35	(2)
			1.0055	40	(2)
C ₁₂ H ₂₅ ClN	Tetrapropylammonium chloride		1.0334	3	(4)
			1.0296	13	(4)

The values from (2) are densities in air. Information on this point is lacking for the other values in the table.

LITERATURE

(For a key to the periodicals see end of volume)

- (1) Dewar, 135, 91: 216; 05. (2) Garner and Ryder, 4, 127: 720; 25. (3) Körber, 8, 37: 1014; 12. (4) M'David, 68, 30: 515; 10. (5) Müller, 7, 86: 177; 13. (6) Nasini and Bernheimer, 36, 15: 59; 85. (7) Prunier, 34, 85: 808; 77. (8) Timmermans, 64V, 13: 508; 10. (9) Varga, *Diss.*, Budapest, 1911.

COMPRESSIBILITY OF CRYSTALS

P. W. BRIDGMAN

1. NON-METALLIC ELEMENTARY SUBSTANCES

$$\beta = \frac{10^6}{V_1} \times \frac{V_1 - V_2}{P_2 - P_1} \text{ per atm.}$$

C, diamond. $\beta = 0.16$, room temp., 4000–10 000 atm. (1).H, hydrogen. Density of solid at -259.9° and 14 500 atm. > 0.1301. $0.1301 \times 0.58 =$ density of liquid at -259.9° and 1 atm. Whence, for solid hydrogen, $\beta > 29$ (2).I, iodine. $\beta = 13.2$, 20°C , 100–500 atm. (3).P, red phosphorus. $\beta = 9.3$, 20°C , 100–500 atm. (3).P, white phosphorus. $\beta = 20.8$, 20°C , 100–500 atm. (3).S, sulfur. $\beta = 13.1$, 20°C , 100–500 atm. (3).

LITERATURE

(For a key to the periodicals see end of volume)

(1) Adams, 128, 11: 45; 21. (2) Bridgman, 65, 59: 173; 24. (3) Richards, 1, 37: 1643; 15.

COMPRESSIBILITY OF PURE METALS

W. ROSENHAIN, SPECIAL EDITOR

C. BENEDICKS (CB); C. H. DESCH (CHD); D. HANSON (DH); C. H. M. JENKINS (CHMJ); P. D. MERICA (PDM); T. K. ROSE (TKR); P. W. BRIDGMAN (PWB)*

Linear compressibility, $\varphi = -\frac{1}{l_0} \frac{\partial l}{\partial P}$.Cubic compressibility, $\beta = -\frac{1}{V_0} \frac{\partial V}{\partial P}$.

$$A_P = \frac{1}{\beta_0} \left[\frac{\partial \beta}{\partial P} \right]_{P=0} \quad A_t = \frac{1}{\beta_0} \left[\frac{\partial \beta}{\partial t} \right]_{P=0, t=t_0}$$

 $\beta' = 3\varphi$ (for any substance)

$$A'_P = \frac{1}{\beta'_0} \left[\frac{\partial \beta'}{\partial P} \right]_{P=0} \quad A'_t = \frac{1}{\beta'_0} \left[\frac{\partial \beta'}{\partial t} \right]_{P=0, t=t_0}$$

 l = length, V = volume, P = pressure in normal atmospheres.Where a range of P is given, values are a mean over this range.

CUBIC COMPRESSIBILITY OF PURE METALS

Metal	$t, ^\circ\text{C}$	P , or ΔP , atm.	$10^6\beta$	Remarks	Lit.	Coop. Exp.
Ag	30	0	1.020	$3\varphi^*$	(3)	TKR
	30	11 600	0.911			
	20	99–493	1.02	Hg standard†	(9)	
	20	0–9870	0.98	Fe standard‡	(1)	
	ca. 20	Stresses within elastic limit	.93	From E and λ §	(6)	
	–191		.732	Mallock's method||	(7)	
	16		.789			
	134		.863			
	166		.891			
Al	30	0	1.384	$3\varphi^*$	(3)	Ed.
	30	11 600	1.298			
	20	99–493	1.49	Hg standard†	(9)	
	20	0–9870	1.34	Fe standard‡	(1)	
	ca. 20	Stresses within elastic limit	1.36	From E and λ §	(6)	
	–191		1.36	Mallock's method||	(7)	
	15		1.51			
	125		1.76			
As	20	99–493	4.55	Hg standard†	(9)	CHD
Au	30	0	0.603	$3\varphi^*$	(3)	TKR
	30	11 600	.552			
	20	99–493	.65	Hg standard†	(9)	
	20	0–9870	.58	Fe standard‡	(1)	
	ca. 20	Stress < EL¶	.61	From E and λ §	(6)	
B	20	99–493	0.3	Hg standard†	(9)	CHD
Bi	20	99–493	3.0	Hg standard†	(9)	Ed.
	20	0	3.04	Fe standard‡	(1)	
	20	9870	2.60	From E and λ §	(6)	
	ca. 20	Stress < EL¶	3.2			
C**	20	99–493	3.0	Hg standard†	(9)	Ed.
Ca	30	0	5.885	$3\varphi^*$	(3)	Ed.
	30	11 600	5.300			
	20	99–493	5.8	Hg standard†	(9)	CHD
	20	0	2.27	Fe standard‡	(1)	CHMJ
Cd	20	9870	1.72	Hg standard†	(9)	
	20	99–493	2.1			
	ca. 20	Stress < EL¶	2.4	From E and λ §	(6)	

* Data marked "Ed." have been added by the editorial office.

Metal	$t, ^\circ\text{C}$	P , or ΔP , atm.	$10^6\beta$	Remarks	Lit.	Coop. Exp.
Ce	30	0	3.692	$3\varphi^*$	(3)	Ed.
	30	11 600	3.223			
Co	30	0	0.557	$3\varphi^*$	(3)	Ed.
	30	11 600	.506			
Cr	20	99–493	0.9	Hg standard†	(9)	CHD
Cs	20	99–493	62	Hg standard†	(9)	CHD

v. also Fig. 1 (5)

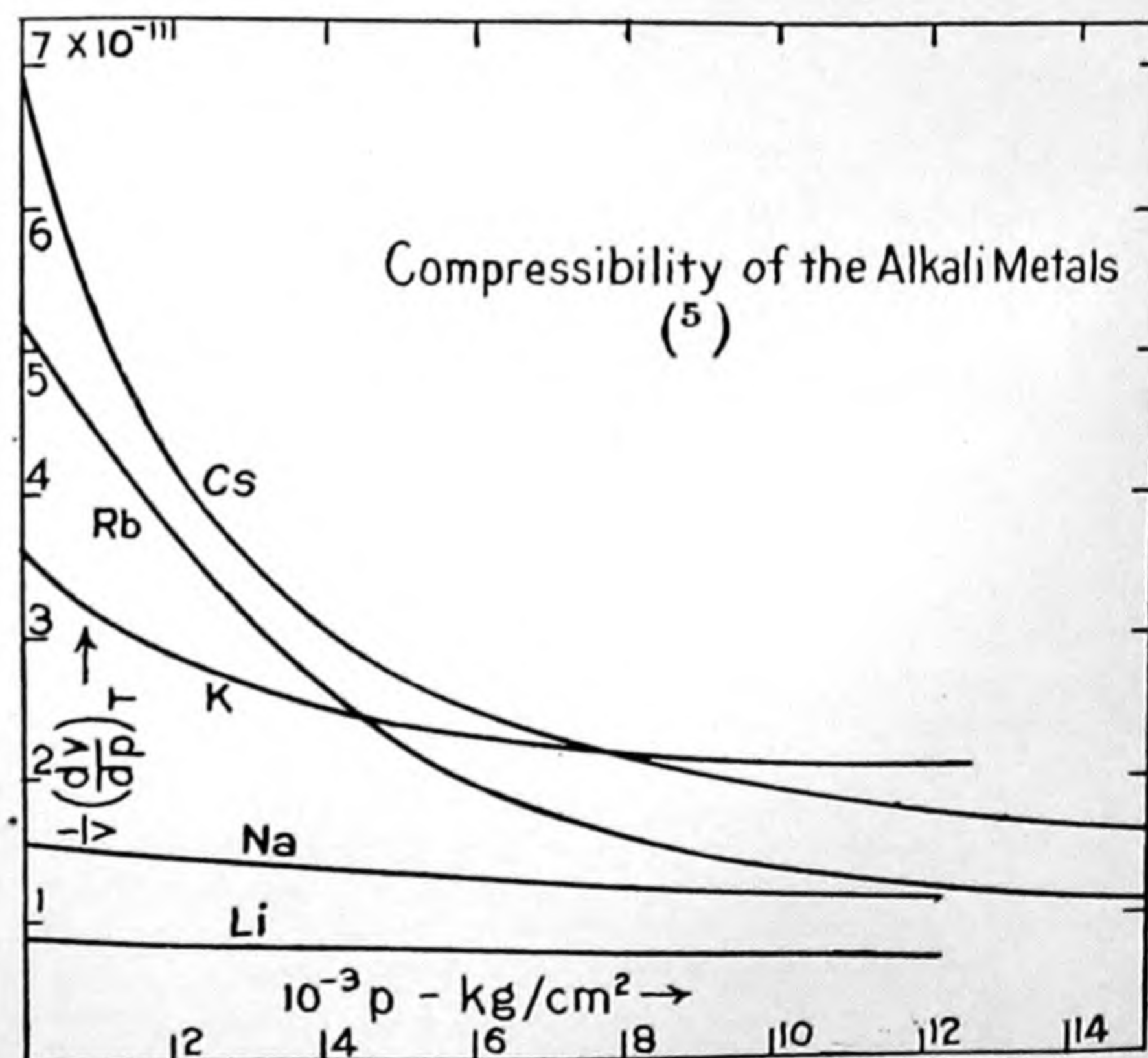


Fig. 1.

Metal	$t, ^\circ\text{C}$	P , or ΔP , atm.	$10^6\beta$	Remarks	Lit.	Coop. Exp.
Cu	30	0	0.756	$3\varphi^*$	(3)	DH
	30	11 600	.689			
	20	99–493	.76	Hg standard†	(9)	
	20	0–9870	.76	Fe standard‡	(1)	
	ca. 20	Stresses within elastic limit	.75	From E and λ §	(6)	
	–191		.742	Mallock's method||	(7)	
	17.5		.799			
	113		.843			
	165		.856			

Metal	$t, ^\circ\text{C}$	P , or ΔP , atm.	$10^6\beta$	Remarks	Lit.	Coop. Exp.
Fe	30	0	0.606	$3\varphi^*$	(3)	DH
	30	11 600	.555			
	20	99-493	.61			
	20	0-9870	.61	Hg standard†	(9)	Ed.
	ca. 20	Stresses within elastic limit	.63	C, 0.2 %‡	(1)	
	-190		.626	From E and λ §	(6)	
	18		.654	Mallock's method||	(7)	
	128		.686			
	165		.698			
Ga	20	99-493	1.6-2.4	Solid	(10)	CHD
	M. P.	99-493	4	Liquid		
Ge	30	0	1.423	$3\varphi^*$	(3)	Ed.
	30	11 600	1.255			
Hg	20	99-493	4.00	Hg standard†	(9)	Ed.
				<i>v. infra.</i>		
In	20	99-493	2.7	Hg standard†	(1)	CHD
Ir	30	0	0.277	$3\varphi^*$	(3)	TKR
	30	11 600	.244			
K	20	99-493	32.1	Hg standard†	(9)	CHD
				<i>v. also Fig. 1 (5)</i>		
Li	30	0	8.979	$3\varphi^*$	(3)	CHD
	30	11 600	6.566			
	20	99-493	9.1	Hg standard†	(9)	
				<i>v. also Fig. 1 (5)</i>		
Mg	20	99-493	2.9	Hg standard†	(9)	Ed.
Mn	20	99-493	0.85	Hg standard†	(9)	CHD
Mo	30	0	0.358	$3\varphi^*$	(3)	Ed.
	30	11 600	.328			
	20	99-493	.465	Hg standard†	(9)	CHD
Na	20	99-493	15.8	Hg standard†	(9)	CHD
				<i>v. also Fig. 1 (5)</i>		
Ni	30	0	0.542	$3\varphi^*$	(3)	PDM
	30	11 600	.491			
	20	99-493	.435	Hg standard†	(9)	Ed.
	ca. 20	Stress < EL¶	.58	From E and λ §	(6)	Ed.
Pb	30	0	2.381	$3\varphi^*$	(3)	Ed.
	30	11 600	2.077			
	20	0	2.24	Fe standard†	(1)	
	20	9870	2.19			
	20	99-493	2.36			
Pd	30	0	0.536	$3\varphi^*$	(3)	TKR
	30	11 600	.485			
	20	99-493	.55	Hg standard†	(9)	
	ca. 20	Stress < EL¶	.58	From E and λ §	(6)	
Pt	30	0	0.372	$3\varphi^*$	(3)	TKR
	30	11 600	.328			
	20	99-493	.385	Hg standard†	(9)	
	ca. 20	Stresses within elastic limit	.405	From E and λ §	(6)	
	-189		.385	Mallock's method||	(7)	
	16.8		.405			
Rb	30	0	0.384	$3\varphi^*$	(3)	TKR
	30	11 600	.318			
	20	99-493	2.43	Hg standard†	(9)	Ed.
	20	99-493	12.2	Hg standard†	(8)	Ed.
Si	20	99-493	0.325	Hg standard†	(9)	CHD
Sn	30	0	2.017	$3\varphi^*$	(3)	Ed.
	30	11 600	1.780			
	20	0	1.91	Fe standard†	(1)	
	20	9870	1.66			
	20	99-493	1.9			
	ca. 20	Stresses < EL¶	1.9	From E and λ §	(6)	
	-190		2.2	Mallock's method||	(7)	

Metal	$t, ^\circ\text{C}$	P , or ΔP , atm.	$10^6\beta$	Remarks	Lit.	Coop. Exp.
Ta	30	0	0.495	$3\varphi^*$	(3)	CHD
	30	11 600	.489			
	20	99-493	.54	Hg standard†	(9)	
Tl	20	99-493	2.3	Hg standard†	(9)	Ed.
W	30	0	0.303	$3\varphi^*$	(3)	Ed.
	30	11 600	.266			
	20	99-493	.275	Hg standard†	(9)	CHD
Zn	20	0	1.76	Fe standard†	(1)	CB
	20	9870	1.45			
	20	99-493	1.7	Hg standard†	(9)	

* Metal crystallizes in cubic system, test pieces assumed isotropic.

† Based on $\beta_{\text{Hg}} = 4.00 \times 10^{-6}$ at 20°C .

‡ Based on $\beta_{\text{Fe}} = 0.606 \times 10^{-6}$ at 20°C .

§ β computed from elastic constants E and λ . E from tensile test, λ from tensile test and torsional vibration test.

|| Mallock's method (8) gives β directly from deformation of tube under internal pressure.

¶ Stresses within elastic limit.

** Graphite.

Hg, MERCURY

P. W. BRIDGMAN

Relative volumes (2)

P , atm.	-20°	-10°	0°	$+10^\circ$	20°
1	0.99638	0.99819	1.00000	1.00181	1.00362
1 000	.99268	.99441	0.99614	0.99786	0.99959
2 000	.98904	.99071	.99237	.99403	.99569
3 000	.98549	.98710	.98871	.99032	.99194
4 000	.98204	.98361	.98517	.98675	.98833
5 000		.98024	.98177	.98332	.98486
6 000		.97701	.97851	.98003	.98154
7 000			.97539	.97688	.97836
8 000				.97387	.97534
9 000				.97101	.97246
10 000				.96831	.96974
11 000					.96718
12 000					.96476

Solid Mercury

Along the melting curve the compressibility of the solid is about 10% less than that of the liquid with which it is in equilibrium.

LINEAR COMPRESSIBILITY OF PURE METALS (Ed.) (3, 4)

$$\frac{V'_0 - V'}{V'_0} = 3 \frac{(l_0 - l)}{l_0} = aP - bP^2$$

between 0 and 11 600 atm., except for alkali metals where higher powers of P are needed to express results.

$$\beta' = -\frac{1}{V'_0} \frac{\partial V'}{\partial P} = a - 2bP$$

$$A'_P = \frac{1}{\beta'_0} \left[\frac{\partial \beta'}{\partial P} \right]_{P=0} = \frac{2b}{a}$$

$$A'_t = \frac{1}{\beta'} \left[\frac{\partial \beta'}{\partial t} \right]_{P=0} = \frac{1}{a} \frac{\partial a}{\partial t}$$

(Tables on p. 48-49)

LINEAR COMPRESSIBILITY OF PURE METALS.—(Continued)

Metal	Crystal system*	Axial ratio	Treatment	$t, ^\circ\text{C}$	$10^6\alpha$	$10^{12}\beta$	$10^6 A'_P$	$10^4 A'_t$
Ag	C		Drawn rod, annealed at bright red heat.....	$\left\{ \begin{array}{l} 30 \\ 75 \end{array} \right.$	$\left\{ \begin{array}{l} 1.020 \\ 1.037 \end{array} \right.$	$\left\{ \begin{array}{l} 4.7 \\ 4.8 \end{array} \right.$	$\left\{ \begin{array}{l} 9.2 \\ 9.25 \end{array} \right.$	3.7
Al	C		Hard drawn.....	30	1.384	3.7	5.35	9.5
			Hard drawn and annealed.....	$\left\{ \begin{array}{l} 30 \\ 75 \end{array} \right.$	$\left\{ \begin{array}{l} 1.378 \\ 1.437 \end{array} \right.$	$\left\{ \begin{array}{l} 3.7 \\ 3.7 \end{array} \right.$	$\left\{ \begin{array}{l} 5.35 \\ 5.15 \end{array} \right.$	
			As cast.....	$\left\{ \begin{array}{l} 30 \\ 75 \end{array} \right.$	$\left\{ \begin{array}{l} 1.387 \\ 1.421 \end{array} \right.$	$\left\{ \begin{array}{l} 5.3 \\ 5.45 \end{array} \right.$	$\left\{ \begin{array}{l} 76.5 \\ 7.65 \end{array} \right.$	5.5
Au	C		Drawn rod, annealed at bright red heat $\left\{ \begin{array}{l} \text{long rod} \\ \text{short rod} \end{array} \right.$	30	0.596	3.3	11.1	-2.6
				75	.589	2.2	7.5	
				30	.603	2.2	7.3	
Bi	H		Extruded cylinder (<i>v. infra.</i>).....	30	3.652	29.9	16.4	3.7
				75	3.713	30.6	16.5	
			Cast in graphite mold, chilled at bottom.....	30	2.275	9.6	8.45	0.88
				75	2.284	9.6	8.4	
Ca	C			$\left\{ \begin{array}{l} 30 \\ 75 \end{array} \right.$	$\left\{ \begin{array}{l} 5.885 \\ 6.043 \end{array} \right.$	$\left\{ \begin{array}{l} 50.4 \\ 56.3 \end{array} \right.$	$\left\{ \begin{array}{l} 18.4 \\ 18.6 \end{array} \right.$	6.0
Cd	H	1.89	Cast in graphite mold, chilled at bottom.....	30	2.018	11.4	11.1	7.5
				75	2.086	11.7	11.2	
			Extruded.....	30	1.464	8.0	10.9	5.6
				75	1.501	8.5	11.3	
Ce	C		Unicrystalline casting.....	30	0.885	4.05	9.15	
Co	C		Extruded (probably impure).....	30	3.692	20.2	10.9	0.36
				75	3.698	21.0	11.4	
Cu	C		Swaged, drawn at bright red heat, annealed at red heat.....	30	0.551	2.2	7.9	3.2
				75	.565	2.2	7.8	
Cu	C		Commercial drawn rod.....	30	.756	2.9	7.7	2.1
				75	.763	2.9	7.6	
			Same, annealed.....	30	.753	2.9	7.7	2.4
				75	.761	2.9	7.6	
			Pure ("Best Select").....	30	.743	2.8	7.55	4.5
				75	.758	2.9	7.65	
Fe	C		"Armco" iron, annealed at red heat.....	30	.606	2.2	7.25	2.6
				75	.613	2.2	7.2	
Ge	C		Cast.....	30	1.423	7.25	10.2	-2.2
				75	1.409	7.25	10.3	
Ir	C		Swaged at red heat.....	30	0.277	1.4	10.1	9.6
				75	.290	2.35	16.2	
Li	C		Extruded cold.....	30	8.979	104.0	23.2	7.1
				75	9.266	114.6	24.7	
Mg	H	1.624	Extruded at 500°C, annealed at 300°C.....	30	3.058	21.6	14.1	2.8
				75	3.096	19.2	12.4	
Mo	C		Swaged.....	30	0.358	1.3	7.3	0.6
				75	.359	1.3	7.25	
			Drawn wire.....	30	.373	1.1	5.9	0.6
				75	.374	1.1	5.9	
Ni	C		99% Ni; drawn, annealed at bright red heat.....	30	.542	2.2	8.1	1.2
				75	.545	2.2	8.1	
			Chill cast, forged, drawn, and annealed at bright red heat....	30	.546	2.2	8.05	2.85
				75	.553	2.2	7.95	
Pb	C		Cast in graphite mold, bottom chilled.....	30	2.451	18.4	15.0	5.6
				75	2.513	18.9	15.0	
			Same, extruded 1.5-0.75 cm diam., annealed at 230°C.....	30	2.381	13.1	11.0	5.6
				75	2.441	13.1	10.7	
Pd	C		Massive, annealed 2 hours at 800°C, cooled slowly.....	30	0.536	2.2	8.2	-3.3
				75	.528	2.1	7.95	
			Drawn wire, annealed at bright red heat.....	30	.545	2.2	8.1	1.6
				75	.549	2.2	8.0	
Pt	C		Drawn rod, annealed at 800°C.....	30	.372	1.9	10.2	2.4
				75	.376	1.9	10.1	

Metal	Crystal system*	Axial ratio	Treatment	$t, ^\circ\text{C}$	$10^6\alpha$	$10^{12}\beta$	$10^6 A'_P$	$10^4 A'_t$
Pt	C		Drawn wire, annealed.....	30 75	0.315 .319	0.0 0.0	0.0 0.0	0.0
Rh	C		Swaged at red heat.....	30 75	.384 .393	2.85 2.85	14.8 14.5	5.2
Sb	H	2.647	Cast in graphite mold, chilled at bottom.....	30 75	1.517 1.529	6.6 6.7	8.7 8.8	1.8
			Chill cast (<i>v. infra.</i>).....	30 75	2.108 2.118	13.8 13.8	13.1 13.0	1.05
Sn	C		Cast in graphite mold, annealed at 150°C	30 75	1.757 1.794	5.52 6.14	6.3 6.85	3.4
			Extruded at 125° , aged at 150°C (<i>v. infra.</i>).....	30 75	2.017 2.077	10.2 10.6	10.1 10.2	6.6
Sr			Extruded at 270°C	30 75	8.454 8.538	77.4 76.5	18.3 17.9	2.2
Ta	C		Drawn wire.....	30 75	0.495 .508	0.27 .27	1.09 1.06	5.85
Tl†	H?							
U	†		Rolled strip.....	30 75	0.998 .987	2.7 2.35	5.4 4.8	-2.5
W	C		Swaged (<i>v. infra.</i>).....	30 75	0.303 .305	1.6 1.6	10.6 10.5	1.5
			Drawn wire.....	30 75	.325 .326	1.7 1.6	10.5 10.1	0.7
Zn	H	1.860	<i>v. infra.</i> §.....					

* For data on crystal structure, *v. Vol. I*, p. 340. C = cubic, H = hexagonal.

† Said to be not cubic.

‡ For Tl remelted and extruded from 1.2–0.6 cm:

$P, \text{atm.}$	$t, ^\circ\text{C}$	$100 \frac{V - V_0}{V_0}$	
		30	75
3 000		-0.978	-1.011
6 000		+1.872	+1.908
9 000		2.700	2.724
12 000		3.505	3.554

§ For cast Zn: $10^6\beta' = 0.9$ – 2.4 . For cast and extruded Zn: $10^6\beta' = 0.86$ – 1.28 . For uniaxial casting of Zn, measurements in mutually perpendicular directions gave: $10^6\beta'_1 = 0.498$; $10^6\beta'_2 = 1.59$; $10^6\beta'_3 = 2.14$. Mean = $10^6\beta = 1.41$.

VALUES FOR SINGLE CRYSTALS (ED.) (12)

$$\left. \begin{aligned} \frac{-\Delta l}{l_0} &= aP - bP^2 \\ \frac{-\Delta V}{V_0} &= AP - BP^2 \end{aligned} \right\} P \text{ in kg/cm}^2; \text{ range, 0 to 12 000 kg/cm}^2$$

Metal	Axis of ref.	Di- rec- tion	30°C				75°C			
			$10^6\alpha$	$10^{12}\beta$	10^6A	$10^{12}B$	$10^6\alpha$	$10^{12}\beta$	10^6A	$10^{12}B$
Bi	Hex.	|| ⊥	1.592 0.6624	11.1 4.39	2.917 2.917	22.43	1.580 0.7044	11.6 8.40	2.989	31.13
Sb	Trig.	|| ⊥	1.648 0.5256	20.5 4.56	2.699 2.699	31.6	1.637 0.5091	18.0 3.04	2.655	25.3
Sn	Tet.	|| ⊥	0.6719 0.6022	4.07 4.20	1.876 1.876	13.6	0.6956 0.6144	3.91 4.26	1.924	13.7
Te	Trig.	|| ⊥	-0.4137 2.748	-9.6 52.7	5.082 5.082	101.1	-0.5132 2.777	-13.2 53.6	5.041	85.6
W	Cubic				0.318	1.4			0.318	1.5
Zn	Hex.	|| ⊥	1.298 0.1946	5.32 1.11	1.687 1.687	8.08	1.355 0.2025	7.82 1.47	1.760	11.35

LITERATURE

(For a key to the periodicals see end of volume)

- (1) Adams, Williamson and Johnston, *1*, 41: 12; 19. (2) Bridgman, *65*, 47: 345; 11. (3) Bridgman, *65*, 58: 166; 23. (4) Bridgman, *65*, 59: 109; 23. (5) Bridgman, *2*, 27: 68; 26. (6) Grüneisen, *8*, 25: 825; 08. (7) Grüneisen, *8*, 33: 1239; 10. (8) Mallock, *5*, 74: 50; 04. (9) Richards, *1*, 37: 1643; 15. (10) Richards and Boyer, *1*, 43: 274; 21. (11) Richards and Sameshima, *1*, 42: 49; 20. (12) Bridgman, *65*, 60: 305; 25.

COMPRESSIBILITY OF CRYSTALLINE COMPOUNDS, MINERALS AND ROCKS

L. H. ADAMS

The compressibility β is here defined by the equation:

$$\beta = -\frac{1}{V_0} \left(\frac{\partial V}{\partial P} \right)_t$$

in which (for a given temperature t) V is the volume at the pressure P , and V_0 is the volume at $P = 1$ and (unless otherwise specified) at the temperature t , as given in the third column. The compressibility depends upon the temperature and also on the pressure; its variation with temperature is given by the expression,

$$A_P = \frac{1}{\beta_0} \left(\frac{\partial \beta}{\partial t} \right)_P, \text{ and with pressure by the expression, } A_t = \frac{1}{\beta_0} \left(\frac{\partial \beta}{\partial P} \right)_t,$$

in which β_0 is the value of β at a specified temperature—usually

the same as given in the third column—and at a specified pressure, $P = 1$. The unit of pressure is here the megabarye, Vol. I, p. 34, and hence the values of β are expressed in reciprocal megabaryes. It may be noted that $10^4 \frac{1}{\beta_0} \left(\frac{\partial \beta}{\partial t} \right)_P$ is the relative change of β , in %, for 100° change in temperature. Similarly, $10^4 \frac{1}{\beta_0} \left(\frac{\partial \beta}{\partial P} \right)_t$ is the relative change of β , in %, for 100 megabaryes change in pressure.

The change of α , the thermal expansibility, with pressure is readily calculated from the values for $\frac{1}{\beta_0} \frac{\partial \beta}{\partial t}$, for if

$$\alpha = \frac{1}{V_0} \left(\frac{\partial V}{\partial t} \right)_P,$$

we have the mathematical identity

$$\left(\frac{\partial \alpha}{\partial P} \right)_t = - \left(\frac{\partial \beta}{\partial t} \right)_P.$$

For most solids $\frac{1}{\beta_0} \left(\frac{\partial \beta}{\partial P} \right)_t$ is independent of temperature within the error of experiment. Hence it follows that $\frac{1}{\beta_0} \left(\frac{\partial \beta}{\partial t} \right)_P$ is independent of pressure. It also happens that for most solids the variation of $\frac{1}{\beta_0} \left(\frac{\partial \beta}{\partial P} \right)_t$ with pressure is too small to be measurable.

Usually β is measured by determining the difference between the compressibility of the given substance and that of a reference substance of known compressibility, commonly iron or mercury. The values of β given here have, when necessary, been recalculated to the basis $\beta_{\text{Hg}} = 4.0 \times 10^{-6}$, and $\beta_{\text{Fe}} = 0.598 \times 10^{-6}$, at $t = 20$ and $P = 1$ (5, 8, 13). For Hg, $10^4 \frac{1}{\beta_0} \frac{\partial \beta}{\partial P} = -0.32$ and $10^4 \frac{1}{\beta_0} \frac{\partial \beta}{\partial t} = 18$. Thus at $t = 20^\circ$, $P = 300$, $10^6 \beta = 3.97$, and at $t = 0^\circ$, $P = 125$, $10^6 \beta = 3.85$. For Fe, $10^4 \frac{1}{\beta_0} \frac{\partial \beta}{\partial P} = -0.072$ and $10^4 \frac{1}{\beta_0} \frac{\partial \beta}{\partial t} = 2.2$. Thus at $t = 27$, $P = 7000$, $10^6 \beta = 0.569$.

Where possible the value of β is given at $t = 25$, $P = 1$, but in certain cases when the values of the temperature and pressure coefficients of β are unknown and the temperature and pressure at which β has been determined vary too widely from $t = 25$, $P = 1$, it has been necessary to give β at the particular pressure and temperature at which it was measured.

B-TABLE, STANDARD ARRANGEMENT

In addition to the values recorded below, the compressibility of the solid along the P , T , melting curve may be obtained from the compressibility of the liquid and the observed compressibility difference, for which see Vol. IV, p. 9.

	Formula	Name	t	P	$10^6 \beta$	$-10^4 A_t$	$10^4 A_P$	Lit.
14	H ₂ O	Ice I	-7	300	12			(6, 7, 18)
	H ₂ O	Ice VI	10	7500	4.7			(6, 7)
	Sb ₂ S ₃	Stibnite	0	125	1.50			(12)
	Bi ₂ S ₃	Bismuthinite	0	125	3.32			(12)
	C ₆ H ₆	Benzene	0	1	32.9	2.6	70	(11, 15)
	C ₁₀ H ₈	Naphthalene	25	1	18.5	1.5	17	(11)
	SiO ₂	Quartz	25	1	2.75	0.20	2	(3, 10, 12, 21)
	TiO ₂	Rutile	0	125	0.59			(12)
	ZrO ₂ .SiO ₂	Zircon	0	125	0.86			(12)
	SnO ₂	Cassiterite	0	125	0.49			(12)
	PbCl ₂		20	300	3.4			(19)
	PbS	Galena	25	1	1.91	0.07	6.7	(10, 12)
	PbSO ₄	Anglesite	0	125	1.94			(12)
	PbCO ₃	Cerussite	0	125	1.91			(12)
32	TiCl ₃		20	300	4.9			(16)
	TiBr ₃		20	300	5.3			(16)
	TiI ₃		20	300	6.9			(16)
	ZnO	Zincite	0	125	0.78			(12)
	ZnS	Sphalerite	25	1	1.30	0.03	-4.1	(10, 12)
	ZnS	Wurtzite	25	1	1.36			(12)
	CdCl ₂		20	300	5.95			(19)
	AgCl		20	300	2.40			(16)
	AgBr		20	300	2.74			(14, 16)
	AgI		20	300	4.11			(16)
	Ag ₂ S	Argentite	25	1	2.7	0.03		(10, 12)
	AgNO ₃		0	125	3.67			(12)
	MnCO ₃	Rhodochrosite	0	125	1.3			(12)
	Fe ₂ O ₃	Hematite	0	125	0.60			(12)
	Fe ₃ O ₄	Magnetite	0	1	0.55	0.07	-1	(10, 12)
	FeS ₂	Pyrite	25	1	0.70	0.06	1	(3, 10, 12)
	FeS ₂	Marcasite	25	1	0.82			(12)
	FeAsS	Arsenopyrite	0	125	0.99			(12)
	FeCO ₃	Siderite	0	125	1.00			(12)
	FeTiO ₃	Ilmenite	0	125	0.56			(12)

	Formula	Name	t	P	$10^6 \beta$	$-10^4 A_t$	$10^4 A_P$	Lit.
31	CuFeS ₂	Chalcopyrite	0	125	1.29			(12)
	CoAsS	Cobaltite	25	1	0.77	0.08	4	(10, 12)
	Al ₂ O ₃	Corundum	0	125	0.40			(12)
	3BeO.Al ₂ O ₃ .6SiO ₂	Beryl	0	1	0.60			(12, 21)
76	MgO		0	125	0.72			(12)
	CaF ₂	Fluorite	25	1	1.23	0.11	6	(10, 12, 21)
	CaCl ₂		20	300	4.36			(19)
	CaBr ₂		20	300	4.84			(19)
	CaSO ₄	Anhydrite	0	125	1.84			(12)
	CaSO ₄ .2H ₂ O	Gypsum	0	125	2.50			(12)
	CaCO ₃	Calcite	25	1	1.36	0.06	4	(4, 10, 12, 21)
	CaCO ₃	Aragonite	25	1	1.55			(12)
	CaCO ₃ .MgCO ₃	Dolomite	0	125	1.22			(12)
	CaSiO ₃ .MgSiO ₃	Diopside	25	7000	1.06			(3)
	SrCl ₂		20	300	3.32			(19)
	SrBr ₂		20	300	4.11			(19)
	SrSO ₄	Celestite	25	1	1.59	0.10	3	(10, 12)
	SrCO ₃	Strontianite	0	125	1.75			(12)
81	BaCl ₂		20	300	2.77			(19)
	BaBr ₂		20	300	3.66			(19)
	BaSO ₄	Barite	0	125	1.80			(12, 21)
	BaCO ₃	Witherite	0	125	2.03			(12)
	LiF		25	1	1.53	0.12	2	(20)
	LiCl		25	1	3.50	0.20	7	(17, 19, 20)
	LiBr		25	1	4.30	0.25	8	(17, 19, 20)
	LiI		25	1	7.2			(17, 19)
	LiAl(SiO ₃) ₂	Spodumene	25	1	0.63			(10)
	NaCl		25	1	4.18	0.20	7	(4, 11, 12, 16, 20, 21)
	NaBr		25	1	5.09	0.26	8	(16, 20)
	NaI		25	1	7.1			(16)
	NaNO ₃		0	125	3.84			(12)
	KF		25	1	3.30	0.20	1	(20)
	KCl		25	1	5.65	0.27	5	(12, 16, 20)
	KBr		25	1	6.68	0.32	6	(16, 20)
	KI		25	1	8.56	0.39	6	(16, 20)
	K ₂ O.Al ₂ O ₃ .6SiO ₂	Orthoclase	25	1	1.85	0.15		(3, 12)
	RbCl		25	1	7.40			(17, 19)
	RbBr	(Low-pressure form)	25	1	7.97	0.35		(17, 19, 20)
	RbI	(Low-pressure form)	25	1	9.54	0.43	7	(17, 19, 20)
	CsCl		25	1	5.9			(17, 19)
	CsBr	(Low-pressure form)	25	1	7.0			(17, 19)
	CsI		25	1	9.3			(17, 19)

CRYSTALLINE MATERIALS (MORE THAN ONE COMPONENT)

Composition	Name	t	P	$10^6 \beta$	$-10^4 A_t$	Lit.
(MgSiO ₃) ₈₈ (FeSiO ₃) ₁₂	Enstatite	25	7000	1.00		(3)
(MgSiO ₃) ₇₀ (FeSiO ₃) ₃₀	Hypersthene	25	7000	0.98		(3)
(Mg ₂ SiO ₄) ₉₀ (Fe ₂ SiO ₄) ₁₀	Olivine	25	7000	0.81		(2)
Ab ₁₈ An ₂₂ *.....	Oligoclase	25	1	1.74	0.12	(3)
Ab ₄₈ An ₅₂ *.....	Labradorite	25	1	1.55	0.17	(3)
Or ₉₁ Ab ₉ *.....	Microcline	25	1	1.9	0.15	(3)
	Phlogopite mica†	25	1	2.34	0.17	(3)
	Actinolite‡	25	7000	1.29		(3)
	Augite§	25	7000	1.01		(3)
	Cast iron||	25	2000	0.88	0.2	(3)
	Cast iron	25	300	1.45		(1)
	Tourmaline¶	0	125	0.82		(12)
	Topaz**	25	1	0.61		(21)
	Opal (Mexican)	0	125	6.1		(12)

* An is written for CaO.Al₂O₃.2SiO₂. Ab is written for Na₂O.Al₂O₃.6SiO₂. Or is written for K₂O.Al₂O₃.6SiO₂.

† Essentially R₃Mg₃Al(SiO₄)₃ where R = H, K, Mg, Fe.

‡ Essentially CaO.3(Mg, Fe)O.4SiO₂.

§ Essentially CaSiO₃.(Mg, Fe)SiO₃ (diopside), with Al₂O₃ and Fe₂O₃.

|| Soft gray cast iron. Density at 23°, 7.193.

¶ Essentially H₃Al₃(BOH)₂Si₃O₁₀ with Fe, Mg, Ca, F, Na, K.

** Essentially Al(F, OH)₂SiO₄.

Rocks

At high pressures the compressibilities of most rocks depend mainly on the composition; on the other hand, at pressures below 2000 megabaryes the compressibility may be abnormally high and depends on the degree of compactness of the particular sample. In most instances $\frac{1}{\beta_0} \frac{\partial \beta}{\partial P}$ at pressures above 2000 megabaryes is independent of pressure (within the error of experiment), but at pressures below 2000 it may change rapidly with pressure. In the table here given $\frac{1}{\beta_0} \frac{\partial \beta}{\partial P}$ refers to pressures higher than the pressures for which β is given. In all cases the temperature is approximately 25°.

Rock	P	10 ⁶ β	−10 ⁴ A _t	10 ⁴ A _P	Lit.
Westerly granite.....	2000	2.00	0.10		(3)
Westerly granite.....	300	3.2			(1)
Washington granite.....	2000	2.28	0.29		(3)
Stone Mt. granite.....	2000	1.97	0.12		(3)
Baveno granite.....	300	3.2			(1)
Peterhead granite.....	300	3.0			(1)
Lily Lake granite.....	300	3.2			(1)
Quincy granite.....	300	3.4			(1)
Stanstead granite.....	300	3.7			(1)
Montreal nepheline syenite....	300	2.3			(1)
Sudbury diabase.....	7000	1.23			(3)
Sudbury diabase.....	300	1.36			(1)
Palisade diabase.....	2000	1.8	0.3		(3)
New Jersey basalt.....	2000	2.4	0.4		(3)
Basalt.....	1	1.59	0.17	0.0	(9)
New Glasgow gabbro.....	2000	1.34	0.2		(3)
New Glasgow gabbro.....	300	1.5			(1)
New Glasgow anorthosite.....	500	1.7			(1)
Mt. Johnson essexite.....	300	2.1			(1)
Balsam Gap dunite.....	7000	0.81			(2)
Colorado marble.....	7000	1.36			(3)
Black Belgian marble.....	300	1.7			(1)
Carrara marble.....	300	2.4			(1)
Vermont marble.....	300	2.7			(1)
Tennessee marble.....	300	2.4			(1)
Montreal limestone.....	300	2.3			(1)
Solenhofen limestone.....	6000	1.36		9	(9)

Rock	P	10 ⁶ β	−10 ⁴ A _t	10 ⁴ A _P	Lit.
Ohio sandstone.....	140	8			(1)
Serpentine (talc schist).....	2000	1.79	0.3		(1)
Talc.....	1	1.86	0.3		(9)

COMPRESSIBILITIES OF A SERIES OF TYPICAL PLUTONIC ROCKS (3)
Average composition (by volume)

Rock	Quartz	Ortho- clase	Ande- sine, Ab ₂ An ₁		Biotite	Amphi- bole	P, mega- baryes	10 ⁶ β
Granite.....	30	65			5		2 000	2.11
Granodiorite	11	20	52		10	7	10 000	1.85
Syenite.....		90			5	5	2 000	1.82
Diorite.....			80		5	15	10 000	1.62
		Labra- diorite, Ab ₁ An ₂	Augite	Hyper- sthene	Olivine	Metal- lic iron	2 000	1.86
Gabbro.....		50	40	10			10 000	1.64
Pyroxenite...			50	50			2 000	1.61
Peridotite....				50	50		10 000	1.45
Dunite.....					100		2 000	1.20
Pallasite.....					50	50	10 000	1.12
Siderite.....						100	2 000	1.03
							10 000	0.96
							2 000	0.93
							10 000	0.87
							2 000	0.84
							10 000	0.79
							2 000	0.72
							10 000	0.68
							2 000	0.59
							10 000	0.56

LITERATURE

(For a key to the periodicals see end of volume)

- (1) Adams and Coker, 152, No. 46; 06. (2) Adams and Gibson, 197, 12: 275; 26. (3) Adams and Williamson, 143, 195: 475; 23. (4) Adams, Williamson and Johnston, 1, 41: 12; 19. (5) Bridgman, 65, 47: 345; 11. (6) Bridgman, 65, 47: 439; 12. (7) Bridgman, 65, 48: 310; 12. (8) Bridgman, 65, 58: 166; 23. (9) Bridgman, 12, 7: 81; 24. (10) Bridgman, 12, 10: 483; 25. (11) Essex, 93, 88: 189; 14. (12) Madelung and Fuchs, 8, 65: 289; 21. (13) de Metz, 8, 47: 706; 92. (14) Richards and Bartlett, 1, 37: 470; 15. (15) Richards, Bartlett and Hodges, 1, 43: 1538; 21. (16) Richards and Jones, 1, 31: 158; 09. (17) Richards and Saerens, 1, 46: 934; 24. (18) Richards and Speyers, 1, 36: 491; 14. (19) Saerens, 28, 33: 17; 24. (20) Slater, 2, 23: 488; 24. 65, 61: 135; 26. (21) Voigt, 8, 31: 474, 701; 87. 34: 981; 88. 35: 642; 88. 39: 412; 90.

DENSITY (SPECIFIC GRAVITY) AND THERMAL EXPANSION (UNDER ATMOSPHERIC PRESSURE) OF AQUEOUS SOLUTIONS OF INORGANIC SUBSTANCES AND OF STRONG ELECTROLYTES

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Density of saturated solutions.	Densité des solutions saturées.
Temperature of maximum density.	Température de la densité maximum.

* The tables for which the respective Cooperating Experts are responsible are marked with the initials indicated above, following the formula of the compound, thus, BaCl₂ [GS]. When a different Cooperating Expert has been responsible for collecting the pertinent literature references, this is indicated in a similar manner by his initials following the list of reference numbers.

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* Les tables pour lesquelles les experts coopérants respectifs sont responsables sont marquées avec les initiales indiquées ci-dessus suivant la formule du composé, ainsi, BaCl₂ [GS]. Lorsqu'un expert coopérant autre que celui mentionné ci-dessus a été chargé de recueillir les références bibliographiques convenables, cela est indiqué d'une manière similaire par ses initiales suivant la liste des nombres de références.

INTRODUCTION

Sources of Data.—Each table is the result of a critical examination of all pertinent data. The reference numbers are in some cases marked according to the weight assigned to the authors' values, thus, * some weight, ** greater weight. When such distinction is made, references not specially marked have not been utilized, or contain data of less reliability.

Literature reference numbers which follow the symbol α contain thermal expansion data.

Abbreviations and Units.—The quantities recorded in the tables are temperature in °C, Wt. % of the solute, and density of the solution in g/ml (= specific gravity, $t^\circ/4^\circ$). The Wt. % refers to the formula given except when water of hydration is shown, in which case it refers to the anhydrous substance. Densities and per cents are throughout based on weights *in vacuo*, unless otherwise indicated.

Interpolation.—In general, at least up to 20 or 30 %, linear interpolation may safely be employed throughout the tables for a given temperature. By forming the first and second tabular differences, the error introduced by linear interpolation can easily be estimated: It may reach about $\frac{1}{8}$ of the second tabular difference. No general statement can be made as to whether the accuracy of the original data warrants a refinement over linear interpolation. If desired, the interpolation formula may be used, or the convenient and accurate method (a).

(a) To find the density of a solution containing W_1 Wt. % of solute at $\theta^\circ\text{C}$ when θ is given in the table. Form the function

$$F = \frac{d_s - 1}{W},$$

where d_s is the density of a solution of W Wt. % solute at θ° . Construct the graph, F against W , and interpolate F for W_1 .

(b) To find the Wt. % of solute, W_1 , from the density, when θ is given in the table. Construct the graph, F against $d_s - 1$. Divide $d_s - 1$ by the interpolated value of F .

(c) To find the density of a solution of $\theta^\circ\text{C}$, when θ is not given in the table. It is better to define the function

$$F' = \frac{d_s - d_w}{W},$$

where d_w is the density of water (v. p. 24) at t° . Construct the graphs, F' against W , for the two given temperatures which enclose the temperature θ , and by interpolation construct the graph for the temperature θ . Check by constructing the graphs of F' against t for the two given values of W which enclose W_1 , and interpolate the graph for W_1 .

(d) To find the density of a solution containing C grams (resp. moles, formula wts., equiv. wts.) of solute per liter of solution at $t^\circ\text{C}$. Construct for t° a graph of $W \times d_s$ against d_s , and obtain by interpolation the value of d_s for which $W \times d_s = \frac{1}{10} C$ (resp. $\frac{1}{10} C \times M$, where M is the mol. wt., formula wt., equiv. wt., as the case may be). This is the value sought.

INTRODUCTION

Sources des données.—Chaque table est le résultat d'un examen critique de toutes les données convenables. Les nombres de références sont dans certains cas marqués selon le poids assigné aux valeurs des auteurs, ainsi, * un peu de poids, ** poids plus grand. Lorsqu'une telle distinction est faite, les références qui ne sont pas spécialement marquées n'ont pas été utilisées, ou elles contiennent des données moins dignes de confiance.

Les nombres de références bibliographiques qui suivent le symbole α contiennent des données de dilatation thermique.

Abréviations et unités.—Les quantités mentionnées dans les tables sont: la température en °C, le % poids du corps dissout, et la densité de la solution en g/ml (= poids spécifique, $t^\circ/4^\circ$). Le % poids se rapporte à la formule donnée excepté lorsque l'eau d'hydratation est mise en évidence, auquel cas le % poids se rapporte à la substance anhydre. Les densités et les pour cent sont partout basés sur les poids dans le vide, à moins d'une autre indication.

Interpolation.—En général, on peut employer sans danger dans les tables et pour une température donnée, l'interpolation linéaire au moins jusqu'à 20 ou 30 %. On peut trouver de suite les cas où l'interpolation linéaire introduit des erreurs, en formant la première et la deuxième différence tabulaire: l'erreur due à l'interpolation linéaire peut atteindre $\frac{1}{8}$ de la deuxième différence tabulaire. On ne peut établir d'une façon générale si la précision des données originales justifie une correction après avoir fait l'interpolation linéaire. On peut utiliser si l'on veut ou la formule d'interpolation ou la méthode précise et convenable (a).

(a) Pour trouver la densité d'une solution contenant W_1 % poids de corps dissout à $\theta^\circ\text{C}$ lorsque θ est donné dans la table, il faut former la fonction

$$F = \frac{d_s - 1}{W},$$

où d_s est la densité d'une solution contenant W % poids de corps dissout à θ° , construire le graphique, F par rapport à W et interpoler F pour W_1 .

(b) Pour trouver le % poids de corps dissout, W_1 , à partir de la densité, lorsque θ est donné dans la table, il faut construire le graphique, F par rapport à $d_s - 1$ et diviser $d_s - 1$ par la valeur interpolée de F .

(c) Pour trouver la densité d'une solution à $\theta^\circ\text{C}$, lorsque θ n'est pas donné dans la table, il est préférable de définir la fonction

$$F' = \frac{d_s - d_w}{W},$$

où d_w est la densité de l'eau (v. p. 24) à t° . Construire les graphiques, F' par rapport à W , pour les deux températures données entre lesquelles se trouve la température θ , et par interpolation construire le graphique pour la température θ . Vérifier, en construisant les graphiques de F' par rapport à t pour les deux valeurs données de W entre lesquelles se trouve W_1 , et interpoler le graphique pour W_1 .

(d) Pour trouver la densité d'une solution contenant C grammes (resp. mol. gr., formule poids, équiv. poids) de corps dissout par litre de solution à $t^\circ\text{C}$, construire pour t° un graphique de $W \times d_s$ par rapport à d_s et obtenir par interpolation la valeur de d_s pour laquelle $W \times d_s = \frac{1}{10} C$ (resp. $\frac{1}{10} C \times M$, où M est le poids mol., la formule poids, l'équiv. poids, suivant le cas). On obtient ainsi la valeur cherchée.

EINLEITUNG

Quellen.—Jede Tafel ist das Ergebnis einer kritischen Prüfung aller zweckdienlicher Daten. Die Literaturzahlen sind in einigen Fällen mit Zeichen versehen, welche das Gewicht bezeichnen das den Angaben der Autoren beigelegt worden ist, z. B. * einiges Gewicht, ** grösseres Gewicht. Ist eine solche Auswahl getroffen, so sind Angaben, die nicht besonders bezeichnet sind, nicht verwendet, oder enthalten Werte von geringerer Verlässlichkeit.

Literaturzahlen die dem Zeichen α folgen, enthalten Daten für die thermische Ausdehnung.

Abkürzungen und Einheiten.—Die Zahlenangaben der Tafeln beziehen sich auf Temperaturen in °C, auf Gewichtsprocente (Wt. %) des gelösten Stoffes, die Dichte der Lösung in g/ml (= Spezifisches Gewicht, $t^\circ/4^\circ$). Die Gewichtsprocente (Wt. %) beziehen sich auf die angegebene Formel, ausgenommen, wenn Hydrationswasser angegeben ist, in diesem Fall beziehen sie sich auf den wasserfreien Stoff. Dichte und Procente beziehen sich durchwegs auf das Gewicht im Vakuum, ausser es ist anders angegeben.

Interpolation.—Bis mindestens zu 20 und 30 % hinauf kann man in allen Tafeln bei bestimmter Temperatur sicher linear interpolieren. Ob dies einen Fehler verursacht, kann leicht durch Bildung der ersten und zweiten Tafeldifferenz gefunden werden. Der durch die lineare Interpolation sich ergebende Fehler wird kaum $\frac{1}{8}$ der zweiten Tafeldifferenz ausmachen. Es kann keine allgemeine Aussage darüber gemacht werden, ob die Genauigkeit der Originalwerte eine Verfeinerung über diejenige der linearen Interpolation zulässt. Wenn nötig, so kann man die Interpolationsformel verwenden oder die bequeme und genaue Methode (a).

(a) Es ist die Dichte einer Lösung zu finden, die W_1 Gewichtsprocente (Wt. %) des gelösten Stoffes bei $\theta^\circ\text{C}$ enthält, wenn θ in der Tafel sich vorfindet. Ist d_s die Dichte einer Lösung die W Gewichtsprocente (Wt. %) des gelösten Stoffes enthält, so berechne man F nach der Gleichung

$$F = \frac{d_s - 1}{W}$$

und trage F und W im Koordinatenpapier auf, woraus sich F für das gegebene W_1 ergibt.

(b) Es sind die Gewichtsprocente W_1 (Wt. %) einer Lösung aus der Dichte d_s zu finden, wenn θ in der Tafel sich vorfindet. Man trage F und $d_s - 1$ im Koordinatenpapier auf und dividiere $d_s - 1$ durch den interpolierten Wert von F .

(c) Es ist die Dichte einer Lösung bei $\theta^\circ\text{C}$ zu finden, wenn θ sich nicht in der Tafel vorfindet. Es ist am besten die Gleichung

$$F' = \frac{d_s - d_w}{W}$$

zu verwenden, in welcher d_w die Dichte des Wassers (siehe p. 24) bei t° bedeutet. Man trägt zuerst im Koordinatenpapier F' und W für zwei θ einschliessende Temperaturen auf, durch Interpolation kann man dann die Kurve für θ konstruieren. Trägt man in gleicher Weise F' als Funktion von t für zwei Werte von W auf, welche W_1 einschliessen, so erhält man durch Interpolation W_1 .

(d) Es ist die Dichte d_s einer Lösung zu finden, welche C Gramme (bzw. Mole, Grammformelgewicht, Äquivalentgewicht) in 1 Liter bei $t^\circ\text{C}$ gelöst enthält. Man entwerfe wie oben eine Kurve mit $W \times d_s$ und d_s wodurch man durch Interpolation einen Wert für d_s erhält. Es ist dann $W \times d_s = \frac{1}{10} C$ (bzw. $\frac{1}{10} C \times M$ wo M gleich ist dem Molgewicht, Grammformelgewicht oder Äquivalentgewicht). Dies ist der gesuchte Wert.

INTRODUZIONE

Origine di dati.—Ogni tabella è il risultato dell'esame critico di tutti i dati relativi. In alcuni casi, per ricordare il valore attribuito ai singoli dati, si son fatti seguire i numeri di riferimento da annotazioni come queste: * alcuno valore, ** più di valore. Quando è fatta una distinzione tra le varie citazioni, quelle senza contrassegno speciale non sono state utilizzate, oppure contengono dati di minore attendibilità.

I numeri di riferimento della letteratura, quando sono preceduti dal simbolo α , contengono dati di dilatazione termica.

Abbreviazioni e unità.—Le quantità riportate nelle tabelle sono temperature in °C, percentuali in peso di soluto, e densità delle soluzioni in g/ml (= peso specifico, $t^\circ/4^\circ$). La percentuale in peso si riferisce alla formula data tranne che non sia inclusa in questa l'acqua di idratazione, nel qual caso si riferisce alla sostanza anidra. Le densità e le percentuali sono sempre riferite a pesate nel vuoto salvo che non sia indicato diversamente.

Interpolazione.—In genere, almeno fino al 20 o 30 %, si può adoperare con sicurezza la interpolazione lineare in tutte le tabelle per una data temperatura. Si può vedere se la interpolazione lineare introduce errori formando le differenze prime e seconde: l'errore dovuto alla interpolazione lineare appena potrebbe eccedere $\frac{1}{8}$ delle differenze seconde. Non si può stabilire in maniera generica se l'accuratezza dei dati originali consente una precisione superiore a quella che dà la interpolazione lineare. Se si desidera, si può adoperare la formula di interpolazione oppure si può ricorrere al metodo preciso (a).

(a) Si desideri la densità di una soluzione contenente W_1 per cento in peso di soluto a $\theta^\circ\text{C}$, quando θ è dato nella tabella. Si ricava allora

$$F = \frac{d_s - 1}{W}$$

dove d_s è la densità della soluzione con W per cento in peso di soluto a θ° ; si riporta in un diagramma la variazione di F rispetto a W , e si interpola F per W_1 .

(b) Si desideri ricavare il per cento in peso di soluto, W_1 , dalla densità, quando θ è dato nella tabella. Si riporta in un diagramma F rispetto a $d_s - 1$, e si divide $d_s - 1$ per il valore interpolato di F .

(c) Si desideri la densità di una soluzione a $\theta^\circ\text{C}$, quando θ non è dato nella tabella. Si calcola il valore di

$$F' = \frac{d_s - d_w}{W}$$

dove d_w è la densità dell'acqua (v. p. 24) a t° , si traccia la curva che rappresenta il variare di F' rispetto a W per le due temperature che comprendono la temperatura θ , e per interpolazione si costruisce il diagramma per la temperatura θ . Si fa la riprova costruendo i diagrammi che danno i valori di F' rispetto a t per i due valori di W che comprendono W_1 , e si interpola il grafico per W_1 .

(d) Si desideri stabilire la densità di una soluzione contenente C g (oppure moli, pesi corrispondenti alle formule, pesi equivalenti) di soluto per litro di soluzione a $t^\circ\text{C}$. Si traccia per t° un diagramma che rappresenta come varia $W \times d_s$ con d_s , e si ricava per interpolazione il valore di d_s per il quale $W \times d_s = \frac{1}{10} C$ (oppure $\frac{1}{10} C \times M$, dove M è il peso molecolare, il peso corrispondente alla formula, o il peso equivalente a seconda dei casi). Questo è il valore cercato.

SYSTEMS CONTAINING ONE SOLUTE

Standard arrangement

H₂O₂ [JAB] (399)**; (77, 90) [LJG]

%	d_4^0	d_4^{18}	%	d_4^0	d_4^{18}	%	d_4^0	d_4^{18}
1	1.0038	1.0022	20	1.0797	1.0725	55	1.2322	1.2188
2	1.0078	1.0058	22	1.0879	1.0802	60	1.2559	1.2416
4	1.0157	1.0131	24	1.0962	1.0880	65	1.2804	1.2652
6	1.0236	1.0204	26	1.1046	1.0959	70	1.3056	1.2897
8	1.0316	1.0277	28	1.1131	1.1040	75	1.3314	1.3149
10	1.0395	1.0351	30	1.1216	1.1122	80	1.3576	1.3406
12	1.0475	1.0425	35	1.1431	1.1327	85	1.3842	1.3667
14	1.0555	1.0499	40	1.1648	1.1536	90	1.4112	1.3931
16	1.0635	1.0574	45	1.1868	1.1749	95	1.4385	1.4197
18	1.0716	1.0649	50	1.2092	1.1966	100	1.4660	1.4465

HF [JAB] (148, 296, 648)**;
(165, 267, 660)

HClO₃ [JAB] (288,
514)**; (529)*; (327)
[LJG]

%	d_4^0	d_4^{20}	%	d_4^0	%	d_4^{18}	d_4^{25}
5	1.020	1.017	70	1.258	1	1.0044	1.0030
10	1.040	1.035	72	1.261	2	1.0103	1.0089
15	1.060	1.053	74	1.262	4	1.0222	1.0208
20	1.080	1.070	76	1.262	6	1.0344	1.0328
25	1.099	1.086	78	1.261	8	1.0468	1.0449
30	1.119	1.101	80	1.259	10	1.0594	
35	1.139	1.116	82	1.255	12	1.0723	
40	1.159	1.130	84	1.246	14	1.0856	
45	1.178	1.143	86	1.233	16	1.0991	
50	1.198	1.155	88	1.213	18	1.1130	
55	1.217		90	1.178	20	1.1273	
60	1.235		95	1.089	22	1.1419	
65	1.248		100	1.0005	24	1.1568	

HClO₄ [LJG] (171, 514, 658)**; (521, 529)

%	d_4^{15}	d_4^{25}	d_4^{50}	%	d_4^{15}	d_4^{20}	d_4^{50}
1	1.0050	1.0020	0.9933	26	1.1738	1.1697	1.1490
2	1.0109	1.0070	0.9986	28	1.1900	1.1851	1.1645
4	1.0228	1.0169	0.9906	30	1.2067	1.2013	1.1800
6	1.0348	1.0270	1.0205	32	1.2239	1.2183	1.1960
8	1.0471	1.0372	1.0320	34	1.2418	1.2359	1.2130
10	1.0597	1.0475	1.0440	36	1.2603	1.2542	1.2310
12	1.0726		1.0560	38	1.2794	1.2732	1.2490
14	1.0859		1.0680	40	1.2991	1.2927	1.2680
16	1.0995		1.0810	45	1.3521	1.3450	1.3180
18	1.1135		1.0940	50	1.4103	1.4018	1.3730
20	1.1279		1.1070	55	1.4733	1.4636	1.4320
22	1.1428		1.1205	60	1.5389	1.5298	1.4950
24	1.1581		1.1345	65	1.6059	1.5986	1.5620
				70	1.6736	1.6680	1.6290

%	75	80	82	84	86	88
d_4^{50}	1.6970	1.7540	1.7670	1.7740	1.7765	1.7755

%	90	92	94	96	98	100
d_4^{20}			1.8086	1.7995	1.7868	1.7676
d_4^{50}	1.7720	1.7655	1.7570	1.7460	1.7310	1.7098

Br [JAB] (325, 565)** [LJG]

%	0.5	1.0	1.5	2.0	2.5	3.0
$d_4^{15.56}$	1.0033	1.0074	1.0113	1.0150	1.0185	1.0218
$d_4^{32.5}$	0.9982	1.0016	1.0051	1.0088	1.0125	

HCl [JAB] (348, 349), α (368)**; (20, 391, 556, 557, 653)*; (18, 43, 44, 98, 106, 125, 144, 167, 170, 197, 200, 204, 214, 221, 224, 239, 247, 273, 306, 312, 313, 318, 319, 321, 323, 327, 333, 340, 344, 354, 378, 385, 387, 409, 418, 451, 463, 483, 491, 514, 519, 528, 529, 551, 589, 592, 593, 596, 628, 645, 654, 660), α (151, 211, 466, 555, 609, 610)

%	-5°C	0°C	+10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.0048	1.0052	1.0048	1.0032	1.0020	1.0006	0.9970	0.9929	0.9881	0.9768	0.9636
2	1.0104	1.0106	1.0100	1.0082	1.0069	1.0055	1.0019	0.9977	0.9930	0.9819	0.9688
4	1.0213	1.0213	1.0202	1.0181	1.0167	1.0152	1.0116	1.0073	1.0026	0.9919	0.9791
6	1.0321	1.0319	1.0303	1.0279	1.0264	1.0248	1.0211	1.0168	1.0121	1.0016	0.9892
8	1.0428	1.0423	1.0403	1.0376	1.0360	1.0343	1.0305	1.0262	1.0215	1.0111	0.9992
10	1.0536	1.0528	1.0504	1.0474	1.0457	1.0439	1.0400	1.0357	1.0310	1.0206	1.0090
12	1.0645	1.0634	1.0607	1.0574	1.0556	1.0537	1.0497	1.0453	1.0406	1.0302	1.0188
14	1.0754	1.0741	1.0711	1.0675	1.0656	1.0636	1.0594	1.0549	1.0502	1.0398	1.0286
16	1.0864	1.0849	1.0815	1.0776	1.0756	1.0735	1.0692	1.0646	1.0598	1.0494	1.0383
18	1.0975	1.0958	1.0920	1.0878	1.0856	1.0834	1.0790	1.0743	1.0694	1.0590	1.0479
20	1.1087	1.1067	1.1025	1.0980	1.0957	1.0934	1.0888	1.0840	1.0790	1.0685	1.0574
22	1.1200	1.1177	1.1131	1.1083	1.1059	1.1034	1.0986	1.0937	1.0886	1.0780	1.0668
24	1.1314	1.1287	1.1238	1.1187	1.1162	1.1135	1.1085	1.1033	1.0982	1.0874	1.0761
26	1.1426	1.1396	1.1344	1.1290	1.1264	1.1236	1.1183	1.1129	1.1076	1.0967	1.0853
28	1.1537	1.1505	1.1449	1.1392	1.1365	1.1336	1.1280	1.1224	1.1169	1.1058	1.0942
30	1.1648	1.1613	1.1553	1.1493	1.1465	1.1435	1.1376	1.1318	1.1260	1.1149	1.1030
32				1.1593							
34				1.1691							
36				1.1789							
38				1.1885							
40				1.1980							
(348, 349, 586)**											
3.38% (588)											
% $d_4^{17.15}$				% $d_4^{17.15}$				d_4^t t			
0.2 0.999 802				1.2 1.004 845				0.9669 110			
0.4 1.000 819				1.4 1.005 846				0.9606 120			
0.6 1.001 830				1.6 1.006 845				0.9537 130			
0.8 1.002 837				1.8 1.007 842				0.9456 140			
1.0 1.003 842				2.0 1.008 837							

HBr [JAB] (288, 483, 557); (514)*; (12, 29, 43, 44, 244, 319, 321, 327, 340, 463, 490, 519, 520, 547, 589, 600)**

%	d_4^4	d_4^{10}	d_4^{20}	d_4^{25}
1	1.0073	1.0068	1.0053	1.0041
2	1.0146	1.0139	1.0124	1.0111
4	1.0295	1.0285	1.0269	1.0255
6	1.0448	1.0435	1.0417	1.0402
8	1.0604	1.0589	1.0568	1.0552
10	1.0764	1.0747	1.0723	1.0707
12	1.0928	1.0910	1.0883	1.0867
14	1.1097	1.1078	1.1048	1.1032
16	1.1272	1.1251	1.1219	1.1202
18	1.1453	1.1430	1.1396	1.1377
20	1.1640	1.1615	1.1579	1.1557
22	1.1832	1.1806	1.1767	1.1743
24	1.2030	1.2003	1.1961	1.1935
26	1.2235	1.2206	1.2161	1.2134
28	1.2446	1.2415	1.2367	1.2340
30	1.2663	1.2630	1.2580	1.2552
35	1.3243	1.3208	1.3150	1.3118
40	1.3877	1.3838	1.3772	1.3736
45	1.4564	1.4521	1.4446	1.4405
50	1.5305	1.5257	1.5173	1.5127
55	1.6100	1.6047	1.5953	1.5902
60	1.6950	1.6892	1.6787	1.6731
65	1.7854	1.7792	1.7675	1.7613

HI [JAB] (288, 483); (557)*; (12, 43, 44, 224, 327, 340, 463, 600)**

%	d_4^4	d_4^{10}	d_4^{20}	d_4^{25}
1	1.0075	1.0070	1.0054	1.0042
2	1.0150	1.0144	1.0127	1.0114
4	1.0305	1.0296	1.0277	1.0262
6	1.0465	1.0452	1.0431	1.0415
8	1.0629	1.0612	1.0589	1.0573
10	1.0797	1.0777	1.0751	1.0735
12	1.0970	1.0947	1.0918	1.0902
14	1.1148	1.1122	1.1091	1.1074
16	1.1331	1.1303	1.1270	1.1252
18	1.1521	1.1491	1.1456	1.1437
20	1.1719	1.1687	1.1649	1.1629
22	1.1925	1.1891	1.1850	1.1829
24	1.2139	1.2103	1.2059	1.2037
26	1.2361	1.2323	1.2277	1.2254
28	1.2591	1.2551	1.2503	1.2479
30	1.2829	1.2788	1.2737	1.2712
35	1.3460	1.3416	1.3357	1.3329
40	1.4143	1.4096	1.4029	1.3998
45	1.4880	1.4829	1.4755	1.4720

HIO₃ [JAB] (245, 288, 358); (594)*; (327, 517, 529) [LJG]**

%	d_4^0	d_4^{18}	d_4^{25}	%	d_4^0	d_4^{18}
1	1.0085	1.0071	1.0055	18	1.1796	1.1740
2	1.0172	1.0157	1.0139	20	1.2026	1.1969
4	1.0352	1.0334	1.0314	22	1.2263	1.2206
6	1.0539	1.0517	1.0495	24	1.2507	1.2450
8	1.0733	1.0706	1.0682	26	1.2759	1.2700
10	1.0934	1.0900	1.0875	28		1.2956
12	1.1141	1.1100	1.1073	30		1.3218
14	1.1354	1.1306	1.1277	35		1.3900
16	1.1572	1.1519		40		1.4640

HIO₄ [LJG] (594)

%	d_4^{17}	%	d_4^{17}	%	d_4^{17}	%	d_4^{17}
1	1.0076	10	1.0944	20	1.2116	30	1.3545
2	1.0165	12	1.1161	22	1.2376	32	1.3875
4	1.0349	14	1.1388	24	1.2647		
6	1.0539	16	1.1623	26	1.2931		
8	1.0737	18	1.1865	28	1.3230		

SO₂ [JAB] (231); (591)*; (9, 253, 254, 549, 602) [LJG]**

%	1	2	4	6	8	10
$d_4^{15.5}$	1.0040	1.0091	1.0191	1.0292	1.0393	1.0493

H₂SO₄, see p. 56-57

H₂S₂O₆ [LJG]; with 4.05 %, $d_4^{25} = 1.0234$ (529)

H₂S₂O₈ [JAB] (169) [LJG]

%	d_4^{14}	%	d_4^{14}	%	d_4^{14}	%	d_4^{14}
1	1.005	10	1.059	18	1.113	26	1.173
2	1.011	12	1.072	20	1.127	28	1.189
4	1.022	14	1.085	22	1.142	30	1.205
6	1.034	16	1.099	24	1.157	35	1.245
8	1.046						

SeO₂ [JAB] (602); (123, 463, 663) [LJG]**

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0072	6	1.0495	10	1.0858	14	1.1242
2	1.0153	8	1.0674	12	1.1047	16	1.1443
4	1.0321						

H₂SeO₄ [JAB] (149); (91, 663) [LJG]**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0059	26	1.2229	52	1.549	78	2.073
2	1.0136	28	1.2438	54	1.581	80	2.122
4	1.0291	30	1.2653	56	1.614	82	2.174
6	1.0447	32	1.2874	58	1.649	84	2.226
8	1.0605	34	1.3101	60	1.685	86	2.278
10	1.0766	36	1.3334	62	1.722	88	2.332
12	1.0931	38	1.3573	64	1.761	90	2.386
14	1.1101	40	1.3819	66	1.802	92	2.436
16	1.1276	42	1.4073	68	1.844	94	2.483
18	1.1455	44	1.4336	70	1.887	96	2.527
20	1.1639	46	1.4609	72	1.932	98	2.570
22	1.1829	48	1.4892	74	1.978	100	2.611
24	1.2026	50	1.5186	76	2.025		

H₂TeO₃ [JAB] (602) [LJG]

%	1	2	4	6	8	10
d_4^{15}	1.008	1.017	1.034	1.050	1.066	1.083

N₂H₄, Hydrazine [JAB] (152); (78)**

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0002	16	1.0164	35	1.035	75	1.043
2	1.0013	18	1.0186	40	1.038	80	1.040
4	1.0034	20	1.0207	45	1.042	85	1.036
6	1.0056	22	1.0228	50	1.044	90	1.030
8	1.0077	24	1.0248	55	1.046	95	1.022
10	1.0099	26	1.0267	60	1.047	100	1.011
12	1.0121	28	1.0286	65	1.047		
14	1.0143	30	1.0305	70	1.046		

H_2SO_4 [JAB] (156), α (370, 371)**; (20, 247, 248, 335, 340, 341, 344, 348, 349, 390, 392, 393)*; (47, 60, 86, 98, 104, 106, 144, 197, 204, 214, 221, 224, 261, 279, 286, 311, 318, 319, 320, 323, 350, 351, 353, 387, 418, 419, 451, 463, 482, 485, 489, 494, 519, 529, 547, 551, 557, 592, 593, 596), α (151, 203, 355, 359, 409, 466, 489, 547, 555)

%	0°C	10°C	15°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.0074	1.0068	1.0060	1.0051	1.0038	1.0022	0.9986	0.9944	0.9895	0.9779	0.9645
2	1.0147	1.0138	1.0129	1.0118	1.0104	1.0087	1.0050	1.0006	0.9956	0.9839	0.9705
3	1.0219	1.0206	1.0197	1.0184	1.0169	1.0152	1.0113	1.0067	1.0017	0.9900	0.9766
4	1.0291	1.0275	1.0264	1.0250	1.0234	1.0216	1.0176	1.0129	1.0078	0.9961	0.9827
5	1.0364	1.0344	1.0332	1.0317	1.0300	1.0281	1.0240	1.0192	1.0140	1.0022	0.9888
6	1.0437	1.0414	1.0400	1.0385	1.0367	1.0347	1.0305	1.0256	1.0203	1.0084	0.9950
7	1.0511	1.0485	1.0469	1.0453	1.0434	1.0414	1.0371	1.0321	1.0266	1.0146	1.0013
8	1.0585	1.0556	1.0539	1.0522	1.0502	1.0481	1.0437	1.0386	1.0330	1.0209	1.0076
9	1.0660	1.0628	1.0610	1.0591	1.0571	1.0549	1.0503	1.0451	1.0395	1.0273	1.0140
10	1.0735	1.0700	1.0681	1.0661	1.0640	1.0617	1.0570	1.0517	1.0460	1.0338	1.0204
11	1.0810	1.0773	1.0753	1.0731	1.0710	1.0686	1.0637	1.0584	1.0526	1.0403	1.0269
12	1.0886	1.0846	1.0825	1.0802	1.0780	1.0756	1.0705	1.0651	1.0593	1.0469	1.0335
13	1.0962	1.0920	1.0898	1.0874	1.0851	1.0826	1.0774	1.0719	1.0661	1.0536	1.0402
14	1.1039	1.0994	1.0971	1.0947	1.0922	1.0897	1.0844	1.0788	1.0729	1.0603	1.0469
15	1.1116	1.1069	1.1045	1.1020	1.0994	1.0968	1.0914	1.0857	1.0798	1.0671	1.0537
16	1.1194	1.1145	1.1120	1.1094	1.1067	1.1040	1.0985	1.0927	1.0868	1.0740	1.0605
17	1.1272	1.1221	1.1195	1.1168	1.1141	1.1113	1.1057	1.0998	1.0938	1.0809	1.0674
18	1.1351	1.1298	1.1271	1.1243	1.1215	1.1187	1.1129	1.1070	1.1009	1.0879	1.0744
19	1.1430	1.1375	1.1347	1.1318	1.1290	1.1261	1.1202	1.1142	1.1081	1.0950	1.0814
20	1.1510	1.1453	1.1424	1.1394	1.1365	1.1335	1.1275	1.1215	1.1153	1.1021	1.0885
21	1.1590	1.1531	1.1501	1.1471	1.1441	1.1410	1.1349	1.1288	1.1226	1.1093	1.0957
22	1.1670	1.1609	1.1579	1.1548	1.1517	1.1486	1.1424	1.1362	1.1299	1.1166	1.1029
23	1.1751	1.1688	1.1657	1.1626	1.1594	1.1563	1.1500	1.1437	1.1373	1.1239	1.1102
24	1.1832	1.1768	1.1736	1.1704	1.1672	1.1640	1.1576	1.1512	1.1448	1.1313	1.1176
25	1.1914	1.1848	1.1816	1.1783	1.1750	1.1718	1.1653	1.1588	1.1523	1.1388	1.1250
26	1.1996	1.1929	1.1896	1.1862	1.1829	1.1796	1.1730	1.1665	1.1599	1.1463	1.1325
27	1.2078	1.2010	1.1976	1.1942	1.1909	1.1875	1.1808	1.1742	1.1676	1.1539	1.1400
28	1.2160	1.2091	1.2057	1.2023	1.1989	1.1955	1.1887	1.1820	1.1753	1.1616	1.1476
29	1.2243	1.2173	1.2138	1.2104	1.2069	1.2035	1.1966	1.1898	1.1831	1.1693	1.1553
30	1.2326	1.2255	1.2220	1.2185	1.2150	1.2115	1.2046	1.1977	1.1909	1.1771	1.1630
31	1.2409	1.2338	1.2302	1.2267	1.2232	1.2196	1.2126	1.2057	1.1988	1.1849	1.1708
32	1.2493	1.2421	1.2385	1.2349	1.2314	1.2278	1.2207	1.2137	1.2068	1.1928	1.1787
33	1.2577	1.2504	1.2468	1.2432	1.2396	1.2360	1.2289	1.2218	1.2148	1.2008	1.1866
34	1.2661	1.2588	1.2552	1.2515	1.2479	1.2443	1.2371	1.2300	1.2229	1.2088	1.1946
35	1.2746	1.2672	1.2636	1.2599	1.2563	1.2526	1.2454	1.2383	1.2311	1.2169	1.2027
36	1.2831	1.2757	1.2720	1.2684	1.2647	1.2610	1.2538	1.2466	1.2394	1.2251	1.2109
37	1.2917	1.2843	1.2805	1.2769	1.2732	1.2695	1.2622	1.2550	1.2477	1.2334	1.2192
38	1.3004	1.2929	1.2891	1.2855	1.2818	1.2780	1.2707	1.2635	1.2561	1.2418	1.2276
39	1.3091	1.3016	1.2978	1.2941	1.2904	1.2866	1.2793	1.2720	1.2646	1.2503	1.2361
40	1.3179	1.3103	1.3065	1.3028	1.2991	1.2953	1.2880	1.2806	1.2732	1.2589	1.2446
41	1.3268	1.3191	1.3153	1.3116	1.3079	1.3041	1.2967	1.2893	1.2819	1.2675	1.2532
42	1.3357	1.3280	1.3242	1.3205	1.3167	1.3129	1.3055	1.2981	1.2907	1.2762	1.2619
43	1.3447	1.3370	1.3332	1.3294	1.3256	1.3218	1.3144	1.3070	1.2996	1.2850	1.2707
44	1.3538	1.3461	1.3423	1.3384	1.3346	1.3308	1.3234	1.3160	1.3086	1.2939	1.2796
45	1.3630	1.3553	1.3515	1.3476	1.3437	1.3399	1.3325	1.3251	1.3177	1.3029	1.2886
46	1.3724	1.3646	1.3608	1.3569	1.3530	1.3492	1.3417	1.3343	1.3269	1.3120	1.2976
47	1.3819	1.3740	1.3702	1.3663	1.3624	1.3586	1.3510	1.3435	1.3362	1.3212	1.3067
48	1.3915	1.3835	1.3797	1.3758	1.3719	1.3680	1.3604	1.3528	1.3455	1.3305	1.3159
49	1.4012	1.3931	1.3893	1.3854	1.3814	1.3775	1.3699	1.3623	1.3549	1.3399	1.3253
50	1.4110	1.4029	1.3990	1.3951	1.3911	1.3872	1.3795	1.3719	1.3644	1.3494	1.3348
51	1.4209	1.4128	1.4088	1.4049	1.4009	1.3970	1.3893	1.3816	1.3740	1.3590	1.3444
52	1.4310	1.4228	1.4188	1.4148	1.4109	1.4069	1.3991	1.3914	1.3837	1.3687	1.3540
53	1.4412	1.4329	1.4289	1.4248	1.4209	1.4169	1.4091	1.4013	1.3936	1.3785	1.3637
54	1.4515	1.4431	1.4391	1.4350	1.4310	1.4270	1.4191	1.4113	1.4036	1.3884	1.3735
55	1.4619	1.4535	1.4494	1.4453	1.4412	1.4372	1.4293	1.4214	1.4137	1.3984	1.3834
56	1.4724	1.4640	1.4598	1.4557	1.4516	1.4475	1.4396	1.4317	1.4239	1.4085	1.3934
57	1.4830	1.4746	1.4703	1.4662	1.4621	1.4580	1.4500	1.4420	1.4342	1.4187	1.4035
58	1.4937	1.4852	1.4809	1.4768	1.4726	1.4685	1.4604	1.4524	1.4446	1.4290	1.4137
59	1.5045	1.4959	1.4916	1.4875	1.4832	1.4791	1.4709	1.4629	1.4551	1.4393	1.4240
60	1.5154	1.5067	1.5024	1.4983	1.4940	1.4898	1.4816	1.4735	1.4656	1.4497	1.4344
61	1.5264	1.5177	1.5133	1.5091	1.5048	1.5006	1.4923	1.4842	1.4762	1.4602	1.4449

H_2SO_4 —(Continued)

%	0°C	10°C	15°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
62	1.5375	1.5287	1.5243	1.5200	1.5157	1.5115	1.5031	1.4950	1.4869	1.4708	1.4554
63	1.5487	1.5398	1.5354	1.5310	1.5267	1.5225	1.5140	1.5058	1.4977	1.4815	1.4660
64	1.5600	1.5510	1.5465	1.5421	1.5378	1.5335	1.5250	1.5167	1.5086	1.4923	1.4766
65	1.5714	1.5623	1.5578	1.5533	1.5490	1.5446	1.5361	1.5277	1.5195	1.5031	1.4873
66	1.5828	1.5736	1.5691	1.5646	1.5602	1.5558	1.5472	1.5388	1.5305	1.5140	1.4981
67	1.5943	1.5850	1.5805	1.5760	1.5715	1.5671	1.5584	1.5499	1.5416	1.5249	1.5089
68	1.6059	1.5965	1.5920	1.5874	1.5829	1.5785	1.5697	1.5611	1.5528	1.5359	1.5198
69	1.6176	1.6081	1.6035	1.5989	1.5944	1.5899	1.5811	1.5724	1.5640	1.5470	1.5307
70	1.6293	1.6198	1.6151	1.6105	1.6059	1.6014	1.5925	1.5838	1.5753	1.5582	1.5417
71	1.6411	1.6315	1.6268	1.6221	1.6175	1.6130	1.6040	1.5952	1.5867	1.5694	1.5527
72	1.6529	1.6433	1.6385	1.6338	1.6292	1.6246	1.6155	1.6067	1.5981	1.5806	1.5637
73	1.6648	1.6551	1.6503	1.6456	1.6409	1.6363	1.6271	1.6182	1.6095	1.5919	1.5747
74	1.6768	1.6670	1.6622	1.6574	1.6526	1.6480	1.6387	1.6297	1.6209	1.6031	1.5857
75	1.6888	1.6789	1.6740	1.6692	1.6644	1.6597	1.6503	1.6412	1.6322	1.6142	1.5966
76	1.7008	1.6908	1.6858	1.6810	1.6761	1.6713	1.6619	1.6526	1.6435	1.6252	1.6074
77	1.7128	1.7026	1.6976	1.6927	1.6878	1.6829	1.6734	1.6640	1.6547	1.6361	1.6181
78	1.7247	1.7144	1.7093	1.7043	1.6994	1.6944	1.6847	1.6751	1.6657	1.6469	1.6286
79	1.7365	1.7261	1.7209	1.7158	1.7108	1.7058	1.6959	1.6862	1.6766	1.6575	1.6390
80	1.7482	1.7376	1.7323	1.7272	1.7221	1.7170	1.7069	1.6971	1.6873	1.6680	1.6493
81	1.7597	1.7489	1.7435	1.7383	1.7331	1.7279	1.7177	1.7077	1.6978	1.6782	1.6594
82	1.7709	1.7599	1.7544	1.7491	1.7437	1.7385	1.7281	1.7180	1.7080	1.6882	1.6692
83	1.7815	1.7704	1.7649	1.7594	1.7540	1.7487	1.7382	1.7279	1.7179	1.6979	1.6787
84	1.7916	1.7804	1.7748	1.7693	1.7639	1.7585	1.7479	1.7375	1.7274	1.7072	1.6878
85	1.8009	1.7897	1.7841	1.7786	1.7732	1.7678	1.7571	1.7466	1.7364	1.7161	1.6966
86	1.8095	1.7983	1.7927	1.7872	1.7818	1.7763	1.7657	1.7552	1.7449	1.7245	1.7050
87	1.8173	1.8061	1.8006	1.7951	1.7897	1.7842	1.7736	1.7632	1.7529	1.7324	1.7129
88	1.8243	1.8132	1.8077	1.8022	1.7968	1.7914	1.7809	1.7705	1.7602	1.7397	1.7202
89	1.8306	1.8195	1.8141	1.8087	1.8033	1.7979	1.7874	1.7770	1.7669	1.7464	1.7269
90	1.8361	1.8252	1.8198	1.8144	1.8091	1.8038	1.7933	1.7829	1.7729	1.7525	1.7331
91	1.8410	1.8302	1.8248	1.8195	1.8142	1.8090	1.7986	1.7883	1.7783	1.7581	1.7388
92	1.8453	1.8346	1.8293	1.8240	1.8188	1.8136	1.8033	1.7932	1.7832	1.7633	1.7439
93	1.8490	1.8384	1.8331	1.8279	1.8227	1.8176	1.8074	1.7974	1.7876	1.7681	1.7485
94	1.8520	1.8415	1.8363	1.8312	1.8260	1.8210	1.8109	1.8011	1.7914		
95	1.8544	1.8439	1.8388	1.8337	1.8286	1.8236	1.8137	1.8040	1.7944		
96	1.8560	1.8457	1.8406	1.8355	1.8305	1.8255	1.8157	1.8060	1.7965		
97	1.8569	1.8466	1.8414	1.8364	1.8314	1.8264	1.8166	1.8071	1.7977		
98	1.8567	1.8463	1.8411	1.8361	1.8310	1.8261	1.8163	1.8068	1.7976		
99	1.8551	1.8445	1.8393	1.8342	1.8292	1.8242	1.8145	1.8050	1.7958		
100	1.8517	1.8409	1.8357	1.8305	1.8255	1.8205	1.8107	1.8013	1.7922		

 H_2SO_4 —(Continued)

(346)		(348, 349, 586)**		
%	$d_4^{5.96}$	%	$d_4^{13.00}$	$d_4^{18.00}$
0.005	1.000 0140	0.05	0.999 810	0.999 028
0.01	1.000 0576	0.1	1.000 185	0.999 400
0.02	1.000 1434	0.2	1.000 912	1.000 119
0.03	1.000 2276	0.3	1.001 623	1.000 820
0.04	1.000 3104	0.4	1.002 326	1.001 512
0.05	1.000 3920	0.5	1.003 023	1.002 197
0.06	1.000 4726	0.6	1.003 716	1.002 877
0.07	1.000 5523	0.8	1.005 090	1.004 227
0.08	1.000 6313	1.0	1.006 452	1.005 570
0.09	1.000 7098	1.2	1.007 807	1.006 909
0.10	1.000 7880	1.4	1.009 159	1.008 247
0.15	1.001 1732	1.6	1.010 510	1.009 583
0.20	1.001 5514	1.8	1.011 860	1.010 918
0.25	1.001 9254	2.0	1.013 209	1.012 252
0.30	1.002 2961	2.2	1.014 557	1.013 586
0.35	1.002 6639	2.4	1.015 904	1.014 919
0.40	1.003 0292			
0.45	1.003 3923			
0.50	1.003 7534			

 H_2SO_4 —(Continued)

% (588).....	1	2	3	4	5
d_4^{110}	0.9562	0.9616	0.9672	0.9730	0.9790
d_4^{120}	0.9488	0.9544	0.9602	0.9662	0.9724
d_4^{130}	0.9408	0.9466	0.9526	0.9588	0.9653
d_4^{140}	0.9322	0.9382	0.9443	0.9506	0.9571

 HNO_3 , see p. 58–59 NH_3 , see p. 59 NH_2OH , Hydroxylamine [JAB] (15)**; (79)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0002	12	1.0235	24	1.0499	45	1.0997
2	1.0023	14	1.0278	26	1.0545	50	1.1122
4	1.0065	16	1.0322	28	1.0591	55	1.1249
6	1.0107	18	1.0366	30	1.0637		
8	1.0149	20	1.0410	35	1.0755		
10	1.0192	22	1.0454	40	1.0875		

HNO₃ [JAB] (60, 98, 621, 623, 624), α (203, 370, 463, 555, 622)**; (110, 394, 557)*; (44, 78, 106, 144, 197, 214, 221, 224, 247, 313, 318, 319, 321, 323, 344, 347, 352, 378, 386, 463, 483, 485, 504, 514, 519, 529, 551, 574, 592, 596, 628, 649, 660), α (151, 211, 372, 545, 605)

%	0°C	5°C	10°C	15°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.0058	1.00572	1.00534	1.00464	1.00364	1.00241	1.0009	0.9973	0.9931	0.9882	0.9767	0.9632
2	1.0117	1.01149	1.01099	1.01018	1.00909	1.00778	1.0061	1.0025	0.9982	0.9932	0.9816	0.9681
3	1.0176	1.01730	1.01668	1.01576	1.01457	1.01318	1.0114	1.0077	1.0033	1.9982	0.9865	0.9730
4	1.0236	1.02315	1.02240	1.02137	1.02008	1.01861	1.0168	1.0129	1.0084	1.0033	0.9915	0.9779
5	1.0296	1.02904	1.02816	1.02702	1.02563	1.02408	1.0222	1.0182	1.0136	1.0084	0.9965	0.9829
6	1.0357	1.03497	1.03397	1.03272	1.03122	1.02958	1.0277	1.0235	1.0188	1.0136	1.0015	0.9879
7	1.0418	1.0410	1.0399	1.0385	1.0369	1.0352	1.0333	1.0289	1.0241	1.0188	1.0066	0.9929
8	1.0480	1.0471	1.0458	1.0443	1.0427	1.0409	1.0389	1.0344	1.0295	1.0241	1.0117	0.9980
9	1.0543	1.0532	1.0518	1.0502	1.0485	1.0466	1.0446	1.0399	1.0349	1.0294	1.0169	1.0032
10	1.0606	1.0594	1.0578	1.0561	1.0543	1.0523	1.0503	1.0455	1.0403	1.0347	1.0221	1.0083
11	1.0669	1.0656	1.0639	1.0621	1.0602	1.0581	1.0560	1.0511	1.0458	1.0401	1.0273	1.0134
12	1.0733	1.0718	1.0700	1.0681	1.0661	1.0640	1.0618	1.0567	1.0513	1.0455	1.0326	1.0186
13	1.0797	1.0781	1.0762	1.0742	1.0721	1.0699	1.0676	1.0624	1.0568	1.0509	1.0379	1.0238
14	1.0862	1.0845	1.0824	1.0803	1.0781	1.0758	1.0735	1.0681	1.0624	1.0564	1.0432	1.0289
15	1.0927	1.0909	1.0887	1.0865	1.0842	1.0818	1.0794	1.0739	1.0680	1.0619	1.0485	1.0341
16	1.0992	1.0973	1.0950	1.0927	1.0903	1.0879	1.0854	1.0797	1.0737	1.0675	1.0538	1.0393
17	1.1057	1.1038	1.1014	1.0989	1.0964	1.0940	1.0914	1.0855	1.0794	1.0731	1.0592	1.0444
18	1.1123	1.1103	1.1078	1.1052	1.1026	1.1001	1.0974	1.0913	1.0851	1.0787	1.0646	1.0496
19	1.1189	1.1168	1.1142	1.1115	1.1088	1.1062	1.1034	1.0972	1.0908	1.0843	1.0700	1.0547
20	1.1255	1.1234	1.1206	1.1178	1.1150	1.1123	1.1094	1.1031	1.0966	1.0899	1.0754	1.0598
21	1.1322	1.1300	1.1271	1.1242	1.1213	1.1185	1.1155	1.1090	1.1024	1.0956	1.0808	1.0650
22	1.1389	1.1366	1.1336	1.1306	1.1276	1.1247	1.1217	1.1150	1.1083	1.1013	1.0862	1.0701
23	1.1457	1.1433	1.1402	1.1371	1.1340	1.1310	1.1280	1.1210	1.1142	1.1070	1.0917	1.0753
24	1.1525	1.1501	1.1469	1.1437	1.1404	1.1374	1.1343	1.1271	1.1201	1.1127	1.0972	1.0805
25	1.1594	1.1569	1.1536	1.1503	1.1469	1.1438	1.1406	1.1332	1.1260	1.1185	1.1027	1.0857
26	1.1663	1.1638	1.1603	1.1569	1.1534	1.1502	1.1469	1.1394	1.1320	1.1244	1.1083	1.0910
27	1.1733	1.1707	1.1670	1.1635	1.1600	1.1566	1.1533	1.1456	1.1381	1.1303	1.1139	1.0963
28	1.1803	1.1777	1.1738	1.1702	1.1666	1.1631	1.1597	1.1519	1.1442	1.1362	1.1195	1.1016
29	1.1874	1.1847	1.1807	1.1770	1.1733	1.1697	1.1662	1.1582	1.1503	1.1422	1.1251	1.1069
30	1.1945	1.1917	1.1876	1.1838	1.1800	1.1763	1.1727	1.1645	1.1564	1.1482	1.1307	1.1122
31	1.2016	1.1988	1.1945	1.1906	1.1867	1.1829	1.1792	1.1708	1.1625	1.1542	1.1363	1.1175
32	1.2088	1.2059	1.2014	1.1974	1.1934	1.1896	1.1857	1.1772	1.1687	1.1602	1.1419	1.1228
33	1.2160	1.2131	1.2084	1.2043	1.2002	1.1963	1.1922	1.1836	1.1749	1.1662	1.1476	1.1281
34	1.2233	1.2203	1.2155	1.2113	1.2071	1.2030	1.1988	1.1901	1.1812	1.1723	1.1533	1.1335
35	1.2306	1.2275	1.2227	1.2183	1.2140	1.2098	1.2055	1.1966	1.1876	1.1784	1.1591	1.1390
36	1.2375	1.2344	1.2294	1.2249	1.2205	1.2163	1.2119	1.2028	1.1936	1.1842	1.1645	1.1440
37	1.2444	1.2412	1.2361	1.2315	1.2270	1.2227	1.2182	1.2089	1.1995	1.1899	1.1699	1.1490
38	1.2513	1.2479	1.2428	1.2381	1.2335	1.2291	1.2245	1.2150	1.2054	1.1956	1.1752	1.1540
39	1.2581	1.2546	1.2494	1.2446	1.2399	1.2354	1.2308	1.2210	1.2112	1.2013	1.1805	1.1589
40	1.2649	1.2613	1.2560	1.2511	1.2463	1.2417	1.2370	1.2270	1.2170	1.2069	1.1858	1.1638
41	1.2717	1.2680	1.2626	1.2576	1.2527	1.2480	1.2432	1.2330	1.2229	1.2126	1.1911	1.1687
42	1.2786	1.2747	1.2692	1.2641	1.2591	1.2543	1.2494	1.2390	1.2287	1.2182	1.1963	1.1735
43	1.2854	1.2814	1.2758	1.2706	1.2655	1.2606	1.2556	1.2450	1.2345	1.2238	1.2015	1.1783
44	1.2922	1.2880	1.2824	1.2771	1.2719	1.2669	1.2618	1.2510	1.2403	1.2294	1.2067	1.1831
45	1.2990	1.2947	1.2890	1.2836	1.2783	1.2732	1.2680	1.2570	1.2461	1.2350	1.2119	1.1879
46	1.3058	1.3014	1.2955	1.2901	1.2847	1.2795	1.2742	1.2630	1.2519	1.2406	1.2171	1.1927
47	1.3126	1.3080	1.3021	1.2966	1.2911	1.2858	1.2804	1.2690	1.2577	1.2462	1.2223	1.1976
48	1.3194	1.3147	1.3087	1.3031	1.2975	1.2921	1.2867	1.2750	1.2635	1.2518	1.2275	1.2024
49	1.3263	1.3214	1.3153	1.3096	1.3040	1.2984	1.2929	1.2811	1.2693	1.2575	1.2328	1.2073
50	1.3327	1.3277	1.3215	1.3157	1.3100	1.3043	1.2987	1.2867	1.2748	1.2628	1.2377	1.2118
51	1.3391	1.3339	1.3277	1.3218	1.3160	1.3102	1.3045	1.2923	1.2802	1.2680	1.2425	1.2163
52	1.3454	1.3401	1.3338	1.3278	1.3219	1.3160	1.3102	1.2978	1.2856	1.2731	1.2473	1.2208
53	1.3517	1.3462	1.3399	1.3338	1.3278	1.3218	1.3159	1.3033	1.2909	1.2782	1.2521	1.2252
54	1.3579	1.3523	1.3459	1.3397	1.3336	1.3275	1.3215	1.3087	1.2961	1.2833	1.2568	1.2296
55	1.3640	1.3583	1.3518	1.3455	1.3393	1.3331	1.3270	1.3141	1.3013	1.2883	1.2615	1.2339
56	1.3700	1.3642	1.3576	1.3512	1.3449	1.3386	1.3324	1.3194	1.3064	1.2932	1.2661	1.2382
57	1.3759	1.3700	1.3634	1.3569	1.3505	1.3441	1.3377	1.3246	1.3114	1.2981	1.2706	1.2424
58	1.3818	1.3757	1.3691	1.3625	1.3560	1.3495	1.3430	1.3298	1.3164	1.3029	1.2751	1.2466
59	1.3875	1.3813	1.3747	1.3680	1.3614	1.3548	1.3482	1.3348	1.3213	1.3077	1.2795	1.2507
60	1.3931	1.3868	1.3801	1.3734	1.3667	1.3600	1.3533	1.3398	1.3261	1.3124	1.2839	1.2547
61	1.3986	1.3922	1.3855	1.3787	1.3719	1.3651	1.3583	1.3447	1.3308	1.3169	1.2881	1.2587
62	1.4039	1.3975	1.3907	1.3838	1.3769	1.3700	1.3632	1.3494	1.3354	1.3213	1.2922	1.2625
63	1.4091	1.4027	1.3958	1.3888	1.3818	1.3748	1.3679	1.3540	1.3398	1.3255	1.2962	1.2661

HNO₃—(Continued)

%	5°C	10°C	15°C	20°C	25°C	30°C	%	5°C	10°C	15°C	20°C	25°C	30°C
64	1.4078	1.4007	1.3936	1.3866	1.3795	1.3725	83	1.4869	1.4787	1.4704	1.4622	1.4540	1.4456
65	1.4128	1.4055	1.3984	1.3913	1.3841	1.3770	84	1.4903	1.4820	1.4737	1.4655	1.4572	1.4487
66	1.4177	1.4103	1.4031	1.3959	1.3887	1.3814	85	1.4936	1.4852	1.4769	1.4686	1.4603	1.4518
67	1.4224	1.4150	1.4077	1.4004	1.3932	1.3857	86	1.4968	1.4883	1.4799	1.4716	1.4633	1.4548
68	1.4271	1.4196	1.4122	1.4048	1.3976	1.3900	87	1.4999	1.4913	1.4829	1.4745	1.4662	1.4577
69	1.4317	1.4241	1.4166	1.4091	1.4019	1.3942	88	1.5029	1.4942	1.4858	1.4773	1.4690	1.4605
70	1.4362	1.4285	1.4210	1.4134	1.4061	1.3983	89	1.5058	1.4970	1.4885	1.4800	1.4716	1.4631
71	1.4406	1.4328	1.4252	1.4176	1.4102	1.4023	90	1.5085	1.4997	1.4911	1.4826	1.4741	1.4656
72	1.4449	1.4371	1.4294	1.4218	1.4142	1.4063	91	1.5111	1.5023	1.4936	1.4850	1.4766	1.4681
73	1.4491	1.4413	1.4335	1.4258	1.4182	1.4103	92	1.5136	1.5048	1.4960	1.4873	1.4789	1.4704
74	1.4532	1.4454	1.4376	1.4298	1.4221	1.4142	93	1.5156	1.5068	1.4979	1.4892	1.4807	1.4722
75	1.4573	1.4494	1.4415	1.4337	1.4259	1.4180	94	1.5177	1.5088	1.4999	1.4912	1.4826	1.4741
76	1.4613	1.4533	1.4454	1.4375	1.4296	1.4217	95	1.5198	1.5109	1.5019	1.4932	1.4846	1.4761
77	1.4652	1.4572	1.4492	1.4413	1.4333	1.4253	96	1.5220	1.5130	1.5040	1.4952	1.4867	1.4781
78	1.4690	1.4610	1.4529	1.4450	1.4369	1.4288	97	1.5244	1.5152	1.5062	1.4974	1.4889	1.4802
79	1.4727	1.4647	1.4565	1.4486	1.4404	1.4323	98	1.5278	1.5187	1.5096	1.5008	1.4922	1.4835
80	1.4764	1.4683	1.4601	1.4521	1.4439	1.4357	99	1.5327	1.5235	1.5144	1.5056	1.4969	1.4881
81	1.4800	1.4718	1.4636	1.4555	1.4473	1.4391	100	1.5402	1.5310	1.5217	1.5129	1.5040	1.4952
82	1.4835	1.4753	1.4670	1.4589	1.4507	1.4424							

NH₃ [LJG] (197, 503), α (670)**; (665)*; (44, 98, 106, 167, 253, 328, 378, 395, 463, 483, 519, 529, 664, 667, 669, 670, 671), α (211, 336, 664)

%	-15°C	-10°C	-5°C	0°C	+5°C	10°C
1		0.9943	0.9954	0.9959	0.9958	0.9955
2		0.9906	0.9915	0.9919	0.9917	0.9913
4		0.9834	0.9840	0.9842	0.9837	0.9832
6	0.977	0.9766	0.9769	0.9767	0.9760	0.9753
8	0.970	0.9701	0.9701	0.9695	0.9686	0.9677
10	0.964	0.9638	0.9635	0.9627	0.9616	0.9604
12	0.958	0.9576	0.9571	0.9561	0.9548	0.9534
14	0.952	0.9517	0.9510	0.9497	0.9483	0.9467
16	0.947	0.9461	0.9450	0.9435	0.9420	0.9402
18		0.9406	0.9392	0.9375	0.9357	0.9338
20		0.9353	0.9335	0.9316	0.9296	0.9275
22		0.9300	0.9280	0.9258	0.9237	0.9214
24		0.9249	0.9226	0.9202	0.9179	0.9155
26		0.9199	0.9174	0.9148	0.9123	0.9097
28		0.9150	0.9122	0.9094	0.9067	0.9040
30		0.9101	0.9070	0.9040	0.9012	0.8983

%	15°C	20°C	25°C	Determined in a sealed tube (665)	
1	0.9948	0.9939	0.993	%	d_4^{15}
2	0.9905	0.9895	0.988	45	0.849
4	0.9822	0.9811	0.980	50	0.832
6	0.9742	0.9730	0.972	55	0.815
8	0.9665	0.9651	0.964	60	0.796
10	0.9591	0.9575	0.956	65	0.776
12	0.9519	0.9501	0.948	70	0.755
14	0.9450	0.9430	0.941	75	0.733
16	0.9383	0.9362	0.934	80	0.711
18	0.9317	0.9295		85	0.688
20	0.9253	0.9229		90	0.665
22	0.9190	0.9164		95	0.642
24	0.9129	0.9101		100	0.618
26	0.9069	0.9040			
28	0.9010	0.8980			
30	0.8951	0.8920			
32	0.8892				
34	0.8832				
36	0.8772				
38	0.8712				
40	0.8651				

NH₄NO₃ [JAB] (36, 106, 449, 483, 660), α (203, 375)**; (222, 223, 224, 225), α (570, 608)*; (1, 190, 195, 218, 229, 307, 328, 342, 385, 508, 519, 529, 530, 543, 570, 573, 592), α (271)

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.0043	1.0039	1.0023	1.0011	0.9996	0.9961
2	1.0088	1.0082	1.0064	1.0051	1.0036	1.0000
4	1.0178	1.0168	1.0147	1.0132	1.0116	1.0079
6	1.0268	1.0254	1.0230	1.0214	1.0197	1.0158
8	1.0358	1.0340	1.0313	1.0297	1.0278	1.0238
10	1.0448	1.0427	1.0397	1.0380	1.0360	1.0319
12	1.0539	1.0515	1.0482	1.0464	1.0443	1.0400
14	1.0630	1.0603	1.0567	1.0548	1.0527	1.0482
16	1.0721	1.0691	1.0653	1.0633	1.0612	1.0565
18	1.0813	1.0780	1.0740	1.0719	1.0697	1.0649
20	1.0905	1.0870	1.0828	1.0806	1.0783	1.0734
22	1.0997	1.0960	1.0916	1.0894	1.0870	1.0820
24	1.1090	1.1051	1.1005	1.0982	1.0958	1.0907
26	1.1183	1.1142	1.1095	1.1071	1.1047	1.0994
28	1.1277	1.1234	1.1186	1.1161	1.1136	1.1082
30	1.1371	1.1327	1.1277	1.1252	1.1226	1.1171
35	1.1613	1.1565	1.1512	1.1486	1.1458	1.1402
40	1.1862	1.1810	1.1754	1.1727	1.1697	1.1640
45	1.2118	1.2062	1.2003	1.1975	1.1943	1.1885
50	1.2380	1.2320	1.2258	1.2229	1.2195	1.2136

%	50°C	60°C	80°C	%	50°C	60°C	80°C
1	0.9919	0.9870	0.9755	20	1.0682	1.0627	1.0506
2	0.9958	0.9908	0.9793	22	1.0767	1.0711	1.0589
4	1.0036	0.9985	0.9869	24	1.0852	1.0796	1.0673
6	1.0114	1.0063	0.9946	26	1.0938	1.0882	1.0758
8	1.0193	1.0142	1.0024	28	1.1025	1.0968	1.0844
10	1.0272	1.0221	1.0102	30	1.1113	1.1055	1.0931
12	1.0352	1.0301	1.0181	35	1.1342	1.1281	1.1154
14	1.0433	1.0381	1.0261	40	1.1579	1.1515	1.1385
16	1.0515	1.0462	1.0342	45	1.1822	1.1757	1.1623
18	1.0598	1.0544	1.0424	50	1.2072	1.2006	1.1868

% (150)...	1	2	3	4	5
d_4^{16}	1.00314	1.00730	1.01145	1.01560	1.01975

7.769%† (256)

°C	0	10	20	30	40	50
d_4^t	1.03490	1.03314	1.03044	1.02695	1.02308	1.01816

† For 3.945% NH₄NO₃, $d_4^{20} = 1.01451$ (256).

NH₄F [JAB] (288)**; (36, 190)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0034	4	1.0178	8	1.0346	12	1.0487
2	1.0085	6	1.0265	10	1.0420	14	1.0547

NH₄Cl [JAB] (548), α (219)**; (551)*; (1, 36, 38, 45, 86, 87, 101, 105, 106, 144, 190, 199, 215, 218, 219, 221, 223, 224, 225, 229, 247, 261, 278, 328, 344, 347, 378, 385, 425, 447, 449, 477, 483, 519, 529, 533, 543, 573, 592, 596, 618, 644), α (38, 151, 211, 271, 609)

%	0°C	10°C	20°C	25°C	30°C
1	1.0033	1.0029	1.0013	1.0002	0.9987
2	1.0067	1.0062	1.0045	1.0033	1.0018
4	1.0135	1.0126	1.0107	1.0093	1.0077
6	1.0201	1.0189	1.0168	1.0153	1.0136
8	1.0266	1.0251	1.0227	1.0212	1.0195
10	1.0329	1.0311	1.0286	1.0270	1.0253
12	1.0391	1.0370	1.0344	1.0327	1.0310
14	1.0451	1.0428	1.0401	1.0383	1.0366
16	1.0510	1.0485	1.0457	1.0439	1.0422
18	1.0568	1.0541	1.0512	1.0494	1.0477
20	1.0625	1.0596	1.0567	1.0549	1.0532
22	1.0681	1.0651	1.0621	1.0603	1.0587
24	1.0736	1.0705	1.0674	1.0657	1.0641

%	40°C	50°C	60°C	80°C	100°C
1	0.9952	0.9910	0.9861	0.9749	0.9617
2	0.9982	0.9940	0.9891	0.9780	0.9651
4	1.0041	0.9999	0.9950	0.9842	0.9718
6	1.0100	1.0058	1.0009	0.9903	0.9784
8	1.0158	1.0116	1.0067	0.9963	0.9849
10	1.0216	1.0174	1.0125	1.0022	0.9912
12	1.0273	1.0231	1.0182	1.0081	0.9975
14	1.0329	1.0287	1.0239	1.0140	1.0036
16	1.0385	1.0343	1.0296	1.0198	1.0096
18	1.0441	1.0399	1.0353	1.0255	1.0155
20	1.0496	1.0454	1.0409	1.0312	1.0213
22	1.0551	1.0509	1.0465	1.0369	1.0271
24	1.0605	1.0564	1.0520	1.0426	1.0327

Values of $d_4^{20.004}$ (373)

0.01 %	0.02 %	0.03 %	0.04 %	0.05 %
0.998 26593	0.998 29988	0.998 33343	0.998 36668	0.998 39973

5.2733 % (27)

d_4^0	d_4^{10}	d_4^{20}	d_4^{25}	d_4^{30}	d_4^{40}	d_4^{50}
1.01769	1.01654	1.01454	1.01322	1.01171	1.00821	1.00397

% (150).....	0.5	1	2	3
d_4^{16}	1.00063	1.00225	1.00544	1.00859

N₂H₅Cl, Hydrazine hydrochloride [JAB]; 7.60 %, $d_4^{20} = 1.0295$ (15)

NH₄OCl, Hydroxylamine hydrochloride [JAB] (15)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0026	6	1.0246	12	1.0509	18	1.0770
2	1.0070	8	1.0334	14	1.0596		
4	1.0158	10	1.0422	16	1.0683		

N₂H₆Cl₂, Hydrazine dihydrochloride [JAB] (15)

%.....	1	2	4	6	8	10
d_4^{20}	1.0026	1.0070	1.0158	1.0247	1.0338	1.0431

NH₄ClO₃ [LJG]; with 2.54 %, $d_4^{25} = 1.00831$ (529)

NH₄ClO₄ [LJG] (291, 414)**; (529)*

%	d_4^{15}	d_4^{20}	d_4^{25}	%	d_4^{15}	d_4^{20}	d_4^{25}
1	1.0039	1.0029	1.0018	8	1.0386	1.0370	1.0355
2	1.0088	1.0077	1.0065	10	1.0489	1.0470	1.0455
4	1.0186	1.0173	1.0160	12	1.0594	1.0572	1.0557
6	1.0285	1.0271	1.0257	14	1.0701	1.0676	1.0660

NH₄Br [JAB] (229, 287, 483)**; (36, 166, 190, 519, 543, 573, 596)

%	d_4^{18}	d_4^{25}	%	d_4^{18}	d_4^{25}	%	d_4^{18}	d_4^{25}
1	1.0043	1.0027	14	1.0822	1.0799	28	1.1782	1.1753
2	1.0100	1.0084	16	1.0950	1.0927	30	1.1933	1.1901
4	1.0215	1.0198	18	1.1081	1.1058	32	1.2088	1.2053
6	1.0332	1.0314	20	1.1215	1.1191	34	1.2247	1.2209
8	1.0451	1.0432	22	1.1352	1.1327	36		1.2369
10	1.0572	1.0552	24	1.1492	1.1466	38		1.2533
12	1.0696	1.0674	26	1.1635	1.1608	40		1.2702

NH₄I [JAB] (287)**; (36, 190, 225, 229, 342, 378, 483, 511, 519, 543, 618)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0050	10	1.0652	20	1.1407	30	1.2265
2	1.0114	12	1.0795	22	1.1570	35	1.2745
4	1.0244	14	1.0942	24	1.1737	40	1.3264
6	1.0377	16	1.1093	26	1.1908	45	1.3823
8	1.0513	18	1.1248	28	1.2084		

NH₄HSO₄ [JAB]; 66.67 %, $d_4^{15} = 1.4429$ %; $d_4^{25} = 1.4387$ % (483)

(NH₄)₂SO₄ [JAB] (204, 505), α (375, 587)**; (106, 155)*; (1, 36, 101, 190, 221, 223, 224, 225, 328, 342, 405, 425, 477, 483, 517, 519, 529, 533, 573, 592, 615, 618, 642)

%	0°C	10°C	20°C	25°C	30°C
1	1.0061	1.0058	1.0041	1.0030	1.0015
2	1.0124	1.0119	1.0101	1.0089	1.0074
4	1.0248	1.0240	1.0220	1.0207	1.0191
6	1.0372	1.0360	1.0338	1.0324	1.0308
8	1.0495	1.0480	1.0456	1.0441	1.0425
10	1.0618	1.0600	1.0574	1.0558	1.0542
12	1.0740	1.0719	1.0691	1.0675	1.0658
14	1.0861	1.0837	1.0808	1.0791	1.0774
16	1.0980	1.0954	1.0924	1.0907	1.0889
18	1.1098	1.1070	1.1039	1.1022	1.1003
20	1.1215	1.1186	1.1154	1.1136	1.1117
22	1.1332	1.1302	1.1269	1.1250	1.1231
24	1.1448	1.1417	1.1383	1.1364	1.1345
26	1.1563	1.1531	1.1496	1.1477	1.1458
28	1.1677	1.1645	1.1609	1.1589	1.1570
30	1.1791	1.1757	1.1721	1.1701	1.1681
35	1.2072	1.2037	1.2000	1.1980	1.1960
40	1.2350	1.2314	1.2277	1.2257	1.2237
45	1.2626	1.2589	1.2552	1.2532	1.2512
50	1.2899	1.2862	1.2825	1.2805	1.2785

%	40°C	50°C	60°C	80°C	100°C
1	0.9980	0.9939	0.9890	0.9777	0.9644
2	1.0039	0.9997	0.9948	0.9836	0.9705
4	1.0155	1.0113	1.0064	0.9953	0.9826
6	1.0271	1.0228	1.0180	1.0070	0.9946
8	1.0387	1.0344	1.0296	1.0187	1.0066
10	1.0503	1.0460	1.0412	1.0304	1.0185
12	1.0619	1.0576	1.0527	1.0421	1.0303
14	1.0734	1.0691	1.0642	1.0537	1.0421
16	1.0849	1.0805	1.0757	1.0653	1.0539
18	1.0963	1.0919	1.0872	1.0768	1.0656
20	1.1077	1.1033	1.0986	1.0883	1.0772
22	1.1191	1.1147	1.1100	1.0997	1.0888
24	1.1304	1.1260	1.1214	1.1111	1.1003
26	1.1417	1.1373	1.1327	1.1225	1.1118
28	1.1529	1.1485	1.1439	1.1338	1.1232
30	1.1640	1.1597	1.1550	1.1451	1.1346
35	1.1919	1.1876	1.1829	1.1731	1.1629
40	1.2196	1.2153	1.2107	1.2011	1.1910
45	1.2471	1.2429	1.2384	1.2290	1.2189
50	1.2745	1.2704	1.2660	1.2568	1.2466

(NH₄)₂SO₄—(Continued)

% (150)...	1	2	3	4	5
d_4^{15}	1.00500	1.01097	1.01689	1.02277	1.02861

(NH₄)₂S₂O₈ [LJG]; with 2.45 %, $d_4^{25} = 1.00968$ (529)**(NH₄)₂S₂O₈** [JAB]; (602) [LJG]

%.....	1	2	3	4
d_4^{15}	1.0042	1.0093	1.0144	1.0195

H₃PO₄ [LJG] (338, 525), α (203)**; (349, 514), α (247)*; (98, 144, 253, 254, 340, 463, 517, 526, 536, 551, 634, 635, 660)

°C	1 %	2 %	4 %	6 %	8 %	10 %	12 %	14 %	16 %	18 %	20 %
0	1.0057	1.0113	1.0226	1.0339	1.0454	1.0571	1.0690	1.0811	1.0934	1.1061	1.1192
10	1.0054	1.0109	1.0219	1.0330	1.0442	1.0557	1.0673	1.0792	1.0914	1.1039	1.1167
20	1.0038	1.0092	1.0200	1.0309	1.0420	1.0532	1.0647	1.0764	1.0884	1.1008	1.1134
25	1.0026	1.0079	1.0187	1.0295	1.0405	1.0517	1.0631	1.0747	1.0866	1.0990	1.1115
30	1.0012	1.0065	1.0172	1.0279	1.0388	1.0499	1.0612	1.0728	1.0847	1.0969	1.1094
40	0.9976	1.0029	1.0135	1.0241	1.0349	1.0459	1.0571	1.0685	1.0803	1.0925	1.1048

°C	22 %	24 %	26 %	28 %	30 %	35 %	40 %	45 %	50 %	55 %	60 %
10	1.1298	1.1431	1.1567	1.1705	1.1846	1.221	1.259	1.299	1.341	1.385	1.432
20	1.1263	1.1395	1.1529	1.1665	1.1805	1.216	1.254	1.293	1.335	1.379	1.426
25	1.1243	1.1374	1.1507	1.1643	1.1782	1.214	1.251	1.291	1.332	1.376	1.423
30	1.1222	1.1352	1.1484	1.1620	1.1758	1.211	1.249	1.288	1.329	1.373	1.420

°C	65 %	70 %	75 %	80 %	85 %	90 %	92 %	94 %	96 %	98 %	100 %
10	1.481	1.533				1.746	1.770	1.794	1.819	1.844	1.870
20	1.475	1.526	1.579	1.633	1.689	1.743	1.766	1.790	1.815	1.840	1.866
25	1.471	1.522	1.575	1.629	1.685	1.738	1.762	1.786	1.811	1.836	1.862
30	1.468	1.519	1.572	1.626	1.682	1.730	1.754	1.778	1.803	1.828	1.854
40						1.723	1.747	1.771	1.796	1.821	1.846
50						1.715	1.740	1.764	1.789	1.815	1.841

%†	d_4^{15} (349)	%†	d_4^{15} (349)	%†	d_4^{15} (349)
0.1	0.999 221	0.8	1.003 095	2.5	1.012 33
0.2	0.999 793	1.0	1.004 19	3.0	1.015 05
0.4	1.000 900	1.5	1.006 91	4.0	1.020 52
0.6	1.002 000	2.0	1.009 61		

† A correction of 1 % was applied to the concentrations of this table.

NH₄H₂PO₃ [LJG]; with 3.30 %, $d_4^{20} = 1.0131$ (463)**(NH₄)₂HPO₃** [LJG]; with 2.90 %, $d_4^{20} = 1.0141$ (463)**NH₄H₂PO₄** [LJG]; with 2.88 %, $d_4^{20} = 1.0174$ (463)**(NH₄)₂HPO₄** [LJG]; with 6.36 %, $d_4^{15} = 1.038$ (144); with 6.90 %, $d_4^{20} = 1.0360$ (561)**(NH₄)₃PO₄** [LJG]; with 2.49 %, $d_4^{20} = 1.00971$ (463)**As₂O₃** [JAB] (112) [LJG]; $d_4^{15} = 1.0032$ with 0.5 %; = 1.0073 with 1.0 %**H₃AsO₄** [JAB] (514)**; (76, 356, 453, 463, 496, 517, 536) [LJG]

%	d_4^{15}	d_4^{25}	%	d_4^{15}	%	d_4^{15}
1	1.0057	1.0037	16	1.1128	35	1.2829
2	1.0124	1.0103	18	1.1285	40	1.3370
4	1.0260	1.0237	20	1.1447	45	1.3959
6	1.0398	1.0373	22	1.1614	50	1.4602
8	1.0538	1.0512	24	1.1785	55	1.5304
10	1.0681	1.0655	26	1.1961	60	1.6070
12	1.0826	1.0803	28	1.2143	65	1.6904
14	1.0975	1.0956	30	1.2331	70	1.7811

AsI₃ [LJG]; with 1.90 %, $d_4^{19} = 1.0192$ (76)**NH₄H₂AsO₄** [LJG]; with 4.00 %, $d_4^{20} = 1.0235$ (463)**(NH₄)₃AsO₄** [LJG]; with 3.22 %, $d_4^{20} = 1.0170$ (463)**C₁₂H₁₀ClI**, Diphenyliodonium chloride [JAB] (583)

%	1	2	3
d_4^{20}	1.0025	1.0067	1.0110

NH₄HSeO₃ [LJG]; with 4.87 %, $d_4^{20} = 1.0305$ (463)**(NH₄)₂SeO₃** [LJG]; with 4.08 %, $d_4^{20} = 1.0255$ (463)**HPO₃** [LJG]; $d_4^{15} = 1.0141$ with 1.954 %; = 1.1083 with 16.23 % (17, 602)**H₃PO₃** [LJG] (463, 660)

%	d_4^{20}	%	d_4^{10}	%	$d_4^{26.8}$	%	$d_4^{25.6}$
4.10	1.0179	26.77	1.1336	30.66	1.1609	73.69	1.4665

C₅H₁₂SO₂, Trimethylsulfonium acetate, [JAB]; with 3.41 %, $d_4^{25} = 1.0018$ (529)**C₃H₉ClS**, Trimethylsulfonium chloride, [JAB]; with 2.82 %, $d_4^{25} = 1.0014$ (529)**C₃H₉BrS**, Trimethylsulfonium bromide, [JAB]; with 1.00 %, $d_4^{25} = 0.9993$ (35)**C₃H₉IS**, Trimethylsulfonium iodide, [JAB]; with 1.00 %, $d_4^{25} = 0.9975$ (35)**C₂₄H₂₀I₂SO₄**, Diphenyliodonium sulfate, [JAB]; with 6.43 %, $d_4^{20} = 1.0291$ (583)**HCN** [JAB] (238, 617)**; (88) [LJG]; cf. (672)

%	d_4^{15}	d_4^{10}	d_4^{15}	d_4^{20}	%	d_4^{15}
80				0.759	1	0.998
82			0.758	0.752	2	0.996
84		0.757	0.751	0.745	4	0.993
86	0.757	0.751	0.744	0.738	6	0.989
88	0.751	0.744	0.738	0.731	8	0.984
90	0.744	0.737	0.731	0.724	10	0.978
92	0.738	0.731	0.724	0.717	12	0.971
94	0.731	0.724	0.717	0.711	14	0.964
96	0.725	0.717	0.711	0.704	16	0.956
98	0.718	0.711	0.704	0.697		
100	0.712	0.704	0.697	0.691		

NH₄CHO₂, Formate [JAB] (484)**; (211, 463)

%	d_4^{15}	d_4^{25}	%	d_4^{15}	d_4^{25}	%	d_4^{15}	d_4^{25}
1	1.0019	0.9998	14	1.0366	1.0339	28	1.0713	1.0678
2	1.0046	1.0025	16	1.0418	1.0389	30	1.0760	1.0724
4	1.0101	1.0078	18	1.0469	1.0439	35	1.0874	1.0836
6	1.0155	1.0131	20	1.0519	1.0488	40	1.0984	1.0944
8	1.0209	1.0184	22	1.0568	1.0536	45	1.1089	1.1048
10	1.0262	1.0236	24	1.0617	1.0584	50	1.1189	1.1148
12	1.0314	1.0288	26	1.0665	1.0631	55	1.1285	1.1245

"(NH₄)₂CO₃" (NH₄HCO₃·NH₄CO₂NH₂) [JAB] (215)**;
(241, 242, 395, 509, 510) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0026	10	1.0335	20	1.0675	30	1.1006
2	1.0061	12	1.0403	22	1.0742	35	1.1157
4	1.0130	14	1.0471	24	1.0808	40	1.1294
6	1.0199	16	1.0539	26	1.0874	45	1.1417
8	1.0267	18	1.0607	28	1.0940		

NH₄C₂H₂O₄, Acid oxalate [JAB]; with 3.57 % $d_4^{20} = 1.0140$ (463)

NH₄C₂H₃O₂, Acetate [JAB] (288, 484)**; (211, 224, 463, 529)

%	d_4^{15}	d_4^{18}	d_4^{25}	%	d_4^{15}	d_4^{18}	d_4^{25}
1	1.0013	1.0008	0.9992	20	1.0397	1.0393	1.0368
2	1.0034	1.0030	1.0013	22	1.0434	1.0429	1.0404
4	1.0077	1.0074	1.0055	24	1.0470	1.0465	1.0439
6	1.0119	1.0117	1.0096	26	1.0505	1.0500	1.0473
8	1.0161	1.0159	1.0136	28	1.0540	1.0535	1.0507
10	1.0202	1.0200	1.0176	30	1.0573	1.0569	1.0540
12	1.0242	1.0240	1.0216	35	1.0654		1.0618
14	1.0282	1.0279	1.0255	40	1.0729		1.0691
16	1.0321	1.0318	1.0294	45	1.0800		1.0760
18	1.0359	1.0356	1.0331				

NH₄C₂H₃O₃, Glycolate [JAB]; with 4.65 % $d_4^{20} = 1.0263$ (463)
(NH₄)₂C₂O₄, Oxalate [JAB]; (463)

%	1	2	3	4
d_4^{20}	1.0031	1.0080	1.0128	1.0176

NH₄C₃H₅O₂, Propionate [JAB] (484)**; (463)

%	d_4^{15}	d_4^{25}	%	d_4^{15}	d_4^{25}	%	d_4^{15}	d_4^{25}
1	1.0011	0.9989	16	1.0285	1.0254	35	1.0549	1.0506
2	1.0030	1.0008	18	1.0318	1.0285	40	1.0599	1.0554
4	1.0069	1.0045	20	1.0350	1.0316	45	1.0642	1.0595
6	1.0107	1.0081	22	1.0381	1.0345	50	1.0678	1.0629
8	1.0145	1.0117	24	1.0410	1.0373	55	1.0707	1.0657
10	1.0182	1.0153	26	1.0438	1.0400	60	1.0729	1.0679
12	1.0218	1.0188	28	1.0465	1.0425			
14	1.0252	1.0222	30	1.0491	1.0450			

NH₄C₃H₅O₃, Lactate [JAB]; with 5.36 % $d_4^{20} = 1.0169$ (463)

NH₄C₄H₅O₄, Acid succinate [JAB]; with 4.50 % $d_4^{20} = 1.0140$ (463)

NH₄C₄H₅O₅, Acid malate, [JAB] (463, 546)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.002	8	1.030	16	1.063	24	1.098
2	1.006	10	1.038	18	1.072	26	1.107
4	1.014	12	1.047	20	1.081		
6	1.022	14	1.055	22	1.089		

NH₄C₄H₇O₂, n-Butyrate, [JAB]; with 5.26 % $d_4^{20} = 1.0062$ (463)

NH₄C₄H₇O₃, Isobutyrate, [JAB]; with 5.26 % $d_4^{20} = 1.0064$ (463)

C₄H₁₂N₂O₃, Tetramethylammonium nitrate, [JAB]; with 3.40 % $d_4^{25} = 1.0014$ (529)

(NH₄)₂C₄H₄O₄, Succinate, [JAB]; with 3.80 % $d_4^{20} = 1.0126$ (463)

(NH₄)₂C₄H₄O₅, Malate [JAB] (463, 546)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.002	12	1.046	24	1.095	45	1.185
2	1.006	14	1.054	26	1.104	50	1.207
4	1.014	16	1.062	28	1.112	55	1.230
6	1.022	18	1.070	30	1.120	60	1.253
8	1.030	20	1.079	35	1.142		
10	1.038	22	1.087	40	1.163		

(NH₄)₂C₄H₄O₆, Tartrate [JAB]; 4.60 % $d_4^{20} = 1.0200$ (463)**; (571)

NH₄C₆H₇O₇, Dihydrogen citrate [JAB]; 5.23 % $d_4^{20} = 1.0207$ (463)

C₆H₁₅NO₂, Tetramethylammonium acetate [JAB]; with 3.33 % $d_4^{25} = 0.9981$ (529)

(NH₄)₃C₆H₅O₇, Citrate [JAB]; with 4.05 % $d_4^{20} = 1.0172$ (463)

CH₆CIN, Methylamine hydrochloride [JAB]; with 19.67 % $d_4^{20} = 1.0343$ (15)

C₂H₈CIN, Dimethylamine hydrochloride [JAB] (15)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	0.9992	4	1.0024	8	1.0065	12	1.0104
2	1.0003	6	1.0045	10	1.0085	14	1.0123

C₂H₈CIN, Ethylamine hydrochloride [LJG] (542)**; (483)*;
(15, 328, 329) [JAB]

%	d_4^{21}	%	d_4^{21}	%	d_4^{21}	%	d_4^{21}
1	0.9992	10	1.0096	20	1.0204	45	1.0413
2	1.0003	12	1.0118	25	1.0254	50	1.0441
4	1.0027	14	1.0140	30	1.0300	55	1.0464
6	1.0050	16	1.0162	35	1.0342	60	1.0482
8	1.0073	18	1.0183	40	1.0380	65	1.0495

C₄H₁₂CIN, Diethylamine hydrochloride [LJG] (542)**; (483)*;
(15) [JAB]

%	d_4^{21}	%	d_4^{21}	%	d_4^{21}	%	d_4^{21}
1	0.99835	12	1.00209	24	1.00675	45	1.0136
2	0.99869	14	1.00280	26	1.00758	50	1.0144
4	0.99936	16	1.00354	28	1.00839	55	1.0147
6	1.00004	18	1.00431	30	1.00918	60	1.0145
8	1.00072	20	1.00510	35	1.0110		
10	1.00140	22	1.00592	40	1.0125		

C₄H₁₂CIN, Tetramethylammonium chloride, [JAB] (15, 529)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	0.9984	4	0.9991	8	1.0003	12	1.0015
2	0.9987	6	0.9997	10	1.0009	14	1.0021

C₆H₈CIN, Aniline hydrochloride [JAB] (18)

%	d_4^{12}	%	d_4^{12}	%	d_4^{12}	%	d_4^{12}
1	1.0020	10	1.0205	20	1.0409	30	1.0613
2	1.0041	12	1.0246	22	1.0450	35	1.0715
4	1.0082	14	1.0287	24	1.0491		
6	1.0123	16	1.0327	26	1.0531		
8	1.0164	18	1.0368	28	1.0572		

C₆H₁₆CIN, Triethylamine hydrochloride [JAB] (542)

%	d_4^{21}	%	d_4^{21}	%	d_4^{21}	%	d_4^{21}
1	0.9980	12	0.9991	24	1.0025	45	1.0118
2	0.9981	14	0.9995	26	1.0033	50	1.0142
4	0.9982	16	1.0000	28	1.0041	55	1.0166
6	0.9984	18	1.0006	30	1.0049		
8	0.9986	20	1.0012	35	1.0071		
10	0.9988	22	1.0018	40	1.0094		

C₈H₂₀CIN, Tetraethylammonium chloride [JAB] (542)

%	d_4^{21}	%	d_4^{21}	%	d_4^{21}	%	d_4^{21}
1	0.9983	12	1.0011	24	1.0060	45	1.0199
2	0.9986	14	1.0017	26	1.0072	50	1.0241
4	0.9990	16	1.0024	28	1.0084	55	1.0287
6	0.9995	18	1.0032	30	1.0097	60	1.0337
8	1.0000	20	1.0041	35	1.0127		
10	1.0006	22	1.0050	40	1.0161		

C₁₂H₂₈CIN, Tetrapropylammonium chloride [JAB] (416)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C
1	0.9997	0.9995	0.9980	0.9968	0.9954	0.9916	0.9872
2	.9995	.9993	.9977	.9965	.9950	.9911	.9864
4	.9992	.9989	.9972	.9960	.9944	.9901	.9849
6	.9990	.9986	.9968	.9955	.9938	.9892	.9836
8	.9989	.9984	.9965	.9951	.9933	.9884	.9825
10	.9990	.9983	.9963	.9948	.9929	.9877	.9816
12	.9991	.9984	.9962	.9945	.9925	.9871	.9808
14	.9993	.9985	.9961	.9943	.9922	.9866	.9801
16	.9997	.9987	.9960	.9942	.9920	.9862	.9795

C₁₂H₂₈ClN.—(Continued)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C
18	1.0003	0.9989	0.9961	0.9941	0.9918	0.9859	0.9791
20	1.0011	.9993	.9962	.9941	.9917	.9857	.9788
22	1.0020	.9999	.9965	.9943	.9919	.9856	.9786
24	1.0031	1.0007	.9970	.9947	.9922	.9858	.9787
26	1.0044	1.0017	.9977	.9953	.9926	.9862	.9789
28	1.0058	1.0029	.9986	.9961	.9931	.9868	.9793

NH₄C₂H₂ClO₂, Chloroacetate [JAB]; 5.58 %, $d_4^{20} = 1.0191$ (463)

NH₄C₂HCl₂O₂, Dichloroacetate [JAB]; 7.30 %, $d_4^{20} = 1.0282$ (463)

NH₄C₂Cl₃O₂, Trichloroacetate [JAB]; 9.02 %, $d_4^{20} = 1.0391$ (463)

C₃H₆ClNO₂, Methyl chloroaminoacetic acid [JAB] (15)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0004	4	1.0069	8	1.0156	12	1.0242
2	1.0026	6	1.0113	10	1.0199	14	1.0284

C₁₂H₁₀INO₃, Diphenyliodonium nitrate [JAB] (583)

%	1	2	3
d_4^{20}	1.0024	1.0068	1.0114

NH₄CNS [JAB] (236, 288)**; (155, 555) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{25}	%	d_4^{25}
1	1.0009	16	1.0356	30	1.0645	46	1.1007
2	1.0032	18	1.0402	32	1.0687	48	1.1057
4	1.0078	20	1.0448	34	1.0730	50	1.1108
6	1.0124	22	1.0495	36	1.0774	52	1.1161
8	1.0170	24	1.0542	38	1.0818	54	1.1214
10	1.0216	26	1.0589	40	1.0863	56	1.1268
12	1.0263	28	1.0636	42	1.0910	58	1.1322
14	1.0309			44	1.0958		

(NH₄)₂CH₂(SO₃)₂, Methanedisulfonate [JAB]; with 5.28 %, $d_4^{20} = 1.0108$ (529)

NH₄C₂H₅SO₄, Hydroxyethylsulfonate [JAB]; with 3.58 %, $d_4^{20} = 1.0115$ (529)

C₃H₉NO₃S, Trimethylsulfonium nitrate [JAB]; with 3.48 %, $d_4^{20} = 1.0056$ (529)

NH₄C₆H₅SO₃, Benzenesulfonate [JAB]; with 4.38 %, $d_4^{20} = 1.0110$ (529)

C₆H₁₅O₂P, Tetramethylphosphonium acetate [JAB]; with 2.76 %, $d_4^{25} = 0.9972$ (529)

C₄H₁₂ClP, Tetramethylphosphonium chloride [JAB]; with 3.17 %, $d_4^{25} = 0.9968$ (529)

C₄H₁₂O₃NP, Tetramethylphosphonium nitrate [JAB]; with 3.83 %, $d_4^{25} = 1.0005$ (529)

PbCl₂ [LJG] (602)

Pb(ClO₃)₂ [JAB] (602) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
0.1	1.00006	0.6	1.00472	1	1.0075	10	1.0911
0.2	1.00099	0.8	1.00658	2	1.0161	12	1.1115
0.4	1.00285	1.0	1.00844	4	1.0338	14	1.1326
				6	1.0523	16	1.1544
				8	1.0714		

Pb(NO₃)₂ [LJG] (250, 291)**; (46, 84, 106, 144, 205, 206, 224, 278, 360, 361, 375, 378, 384, 509, 510, 533, 534, 561, 592, 629), α (375)

°C	1%	2%	4%	6%	8%
0	1.0089	1.0180	1.0364	1.0554	1.0749
10	1.0086	1.0175	1.0357	1.0544	1.0737
18†	1.0074	1.0163	1.0344	1.0529	1.0720
20	1.0070	1.0159	1.0339	1.0524	1.0715
25	1.0058	1.0146	1.0325	1.0509	1.0699
30	1.0044	1.0132	1.0310	1.0493	1.0682
40	1.0009	1.0096	1.0273	1.0454	1.0642
50	0.9967	1.0053	1.0228	1.0409	1.0595
60	0.9917	1.0003	1.0178	1.0357	1.0542
70	0.9863	0.9948	1.0122	1.0300	1.0483

Pb(NO₃)₂.—(Continued)

°C	10%	12%	14%	16%	18%
0	1.0951	1.1160	1.1377	1.1602	1.1838
10	1.0936	1.1143	1.1357	1.1580	1.1814
18†	1.0918	1.1123	1.1336	1.1557	1.1789
20	1.0912	1.1117	1.1329	1.1550	1.1782
25	1.0896	1.1100	1.1311	1.1531	1.1762
30	1.0878	1.1081	1.1291	1.1511	1.1741
40	1.0836	1.1038	1.1247	1.1465	1.1692
50	1.0788	1.0988	1.1196	1.1412	
60	1.0733	1.0932	1.1138	1.1353	
70	1.0673	1.0870	1.1074	1.1287	

°C	20%	22%	24%	26%	28%	30%
0	1.2083	1.2334	1.2590	1.2848	1.3107	1.3363
10	1.2057	1.2306	1.2559	1.2815	1.3072	1.3326
18†	1.2030	1.2277	1.2529	1.2783	1.3037	1.3289
20	1.2022	1.2269	1.2520	1.2774	1.3028	1.3279
25	1.2002	1.2248	1.2498	1.2750	1.3002	1.3254
30	1.1979	1.2224	1.2473	1.2725	1.2977	1.3226
40	1.1928	1.2171	1.2418	1.2667	1.2917	1.3164

† Density data are discordant except at 18°C.

Pb(C₂H₃O₂)₂, Acetate [JAB]; (288)**; (144, 221, 223, 426, 469, 509)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0061	10	1.0768	20	1.1663	30	1.2711
2	1.0137	12	1.0936	22	1.1860	35	1.3304
4	1.0290	14	1.1109	24	1.2063	40	1.3994
6	1.0446	16	1.1283	26	1.2273		
8	1.0605	18	1.1473	28	1.2489		

SnCl₂ [JAB] (221)**; (106) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0068	12	1.0986	24	1.2159	45	1.4897
2	1.0146	14	1.1167	26	1.2377	50	1.5729
4	1.0306	16	1.1353	28	1.2603	55	1.6656
6	1.0470	18	1.1545	30	1.2837	60	1.7695
8	1.0638	20	1.1743	35	1.3461	65	1.8865
10	1.0810	22	1.1948	40	1.4145		

SnCl₄ [JAB] (221, 291)**; (106, 272) [LJG]

%	d_4^{15}	d_4^{18}	%	d_4^{15}	d_4^{18}	%	d_4^{15}	%	d_4^{15}
1	1.007	1.0065	12	1.099	1.0974	24	1.212	45	1.475
2	1.015	1.0145	14	1.117	1.1150	26	1.233	50	1.555
4	1.031	1.0306	16	1.135	1.1331	28	1.255	55	1.644
6	1.047	1.0469	18	1.154	1.1516	30	1.278	60	1.742
8	1.064	1.0634	20	1.173	1.1706	35	1.337	65	1.851
10	1.081	1.0802	22	1.192	1.1901	40	1.403	70	1.971

ThCl₄ [JAB] (291) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0080	8	1.0786	16	1.1707	24	1.2769
2	1.0175	10	1.1005	18	1.1958	26	1.3063
4	1.0371	12	1.1231	20	1.2218	28	1.3371
6	1.0575	14	1.1465	22	1.2488		

Th(NO₃)₄ [JAB] (357) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0079	6	1.0546	12	1.1176	18	1.1885
2	1.0169	8	1.0747	14	1.1404		
4	1.0354	10	1.0957	16	1.1640		

InBr₃ [JAB] (289) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0070	10	1.0888	20	1.1956	30	1.3230
2	1.0155	12	1.1088	22	1.2191	32	1.3523
4	1.0329	14	1.1295	24	1.2434		
6	1.0509	16	1.1508	26	1.2687		
8	1.0695	18	1.1728	28	1.2952		

TIOH [JAB] (16)**; (529) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
20	1.220	24	1.284	28	1.347	32	1.411
22	1.252	26†	1.315	30	1.379	34	1.443

† Supersaturated above 26 %.

TIF [JAB] (291)**; (602) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0082	8	1.0804	16	1.1765	24	1.2868
2	1.0179	10	1.1031	18	1.2026	26	1.3174
4	1.0379	12	1.1267	20	1.2296	28	1.3495
6	1.0587	14	1.1512	22	1.2576	30	1.3833

TiClO₃ [LJG]; with 2.210 %, $d_4^{15} = 1.01791$ (602)Ti₂SO₄ [JAB] (291, 309, 602)**; (106, 206, 529) [LJG]

%	15°C	20°C	25°C	30°C
1	1.0084	1.0076	1.0064	1.0049
2	1.0178	1.0170	1.0158	1.0142
3	1.0274	1.0265	1.0253	1.0237
4	1.0370	1.0360	1.0348	1.0333
5		1.0456		

TiNO₃ [JAB] (317, 602, 629)**; (529) [LJG]

%	0°C	10°C	15°C	20°C	25°C
1	1.0088	1.0086	1.0077	1.0067	1.0056
2	1.0179	1.0172	1.0164	1.0154	1.0142
3	1.0271	1.0263	1.0253	1.0242	1.0230
4			1.0344		1.0319
5			1.0436		1.0409
6					1.0501
7					1.0594

TiC₂H₃O₂, Acetate [JAB]; with 2.19 %, $d_4^{25} = 1.0154$ (529)ZnCl₂ [GS] (288, 366)**; (507, 657)*; (23, 86, 106, 150, 203, 261, 384, 417.5, 462, 464, 466, 599, 618, 628, 629)

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0192	1.0186	1.0167	1.0154	1.0138	1.0099
4	1.0384	1.0373	1.0350	1.0335	1.0317	1.0274
6	1.0576	1.0559	1.0532	1.0515	1.0495	1.0448
8	1.0769	1.0746	1.0715	1.0696	1.0673	1.0624
10	1.0963	1.0934	1.0819	1.0878	1.0853	1.0801
12	1.1159	1.1124	1.1085	1.1063	1.1036	1.0980
14	1.1357	1.1318	1.1275	1.1251	1.1223	1.1163
16	1.1558	1.1515	1.1468	1.1442	1.1413	1.1350
18	1.1762	1.1715	1.1665	1.1638	1.1607	1.1541
20	1.1970	1.1919	1.1866	1.1836	1.1804	1.1736
25	1.2500	1.2441	1.2380	1.2348	1.2313	1.2240
30	1.3062	1.2996	1.2928	1.2894	1.2856	1.2778
35	1.3668	1.3595	1.3522	1.3485	1.3445	1.3362
40	1.4329	1.4250	1.4173	1.4133	1.4090	1.4003
45	1.5050	1.4972	1.4890	1.4847	1.4802	1.4711
50	1.5860	1.5771	1.5681	1.5636	1.5590	1.5495
55			1.655	1.651	1.646	
60			1.749	1.745	1.740	
65			1.851	1.847	1.842	
70			1.962	1.957	1.952	
75				2.076		

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0055	1.0003	0.9945	0.9882	0.9812	0.9739
4	1.0227	1.0172	1.0110	1.0044	0.9971	0.9894
6	1.0398	1.0340	1.0274	1.0206	1.0130	1.0051
8	1.0570	1.0508	1.0439	1.0369	1.0291	1.0211
10	1.0744	1.0679	1.0606	1.0535	1.0456	1.0374
12	1.0921	1.0853	1.0779	1.0704	1.0625	1.0541
14	1.1101	1.1030	1.0955	1.0877	1.0798	1.0712
16	1.1284	1.1212	1.1135	1.1055	1.0975	1.0888

ZnCl₂—(Continued)

%	50°C	60°C	70°C	80°C	90°C	100°C
18	1.1472	1.1399	1.1320	1.1238	1.1137	1.1069
20	1.1665	1.1590	1.1510	1.1428	1.1345	1.1255
25	1.2163	1.2084	1.1999	1.1914	1.1827	1.1734
30	1.2696	1.2614	1.2526	1.2438	1.2347	1.2252
35	1.3276	1.3190	1.3101	1.3009	1.2915	1.2818
40	1.3913	1.3824	1.3732	1.3637	1.3542	1.3441
45	1.4617	1.4525	1.4428	1.4331	1.4238	1.4130
50	1.5399	1.5300	1.5199	1.5097	1.5009	1.4892

Zn(ClO₃)₂ [GS] (287)**; (602)*

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0146	10	1.0823	18	1.1579	35	1.3535
4	1.0309	12	1.1004	20	1.1783		
6	1.0476	14	1.1190	25	1.2322		
8	1.0647	16	1.1381	30	1.2908		

ZnBr₂ [GS] (366, 368, 507)

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0188	1.0184	1.0167	1.0154	1.0139	1.0102
4	1.0381	1.0374	1.0354	1.0340	1.0324	1.0285
6	1.0578	1.0567	1.0544	1.0529	1.0512	1.0471
8	1.0777	1.0763	1.0738	1.0721	1.0704	1.0660
10	1.0980	1.0962	1.0935	1.0917	1.0899	1.0852
12	1.1186	1.1165	1.1135	1.1116	1.1096	1.1046
14	1.1396	1.1371	1.1338	1.1318	1.1296	1.1244
16	1.1609	1.1580	1.1544	1.1523	1.1500	1.1445
18	1.1825	1.1792	1.1753	1.1730	1.1706	1.1649
20	1.2043	1.2007	1.1965	1.1941	1.1915	1.1855
25	1.2641	1.2594	1.2543	1.2516	1.2485	1.2418
30	1.3288	1.3229	1.3170	1.3139	1.3104	1.3030
35	1.3995	1.3926	1.3859	1.3823	1.3785	1.3703
40	1.477	1.470	1.462	1.458	1.454	1.445
45	1.564	1.556	1.547	1.543	1.538	1.529
50	1.661	1.652	1.643	1.638	1.633	1.623
55	1.770	1.760	1.750	1.745	1.739	1.728
60	1.891	1.880	1.869	1.864	1.858	1.845
65	2.026	2.013	2.002	1.995	1.989	1.976

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0059	1.0008	0.9952	0.9890	0.9823	0.9751
4	1.0240	1.0187	1.0129	1.0065	0.9995	0.9921
6	1.0424	1.0369	1.0308	1.0242	1.0171	1.0094
8	1.0611	1.0554	1.0490	1.0422	1.0348	1.0270
10	1.0800	1.0742	1.0676	1.0604	1.0528	1.0448
12	1.0992	1.0932	1.0864	1.0789	1.0712	1.0629
14	1.1187	1.1124	1.1055	1.0978	1.0899	1.0813
16	1.1385	1.1320	1.1248	1.1169	1.1088	1.1000
18	1.1586	1.1519	1.1445	1.1363	1.1279	1.1190
20	1.1790	1.1720	1.1643	1.1560	1.1474	1.1382
25	1.2347	1.2270	1.2188	1.2101	1.2009	1.1911
30	1.2952	1.2868	1.2780	1.2688	1.2591	1.2489
35	1.3618	1.3529	1.3435	1.3337	1.3236	1.3131
40	1.436	1.427	1.417	1.406	1.396	1.385
45	1.519	1.510	1.499	1.488	1.477	1.465
50	1.612	1.602	1.590	1.579	1.568	1.555
55	1.717	1.706	1.694	1.682	1.670	1.657
60	1.834	1.822	1.810	1.797	1.784	1.771
65	1.964	1.951	1.938	1.924	1.911	1.898

Zn(BrO₃)₂ [GS] (291)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0166	10	1.0913	18	1.1774	35	1.4070
4	1.0346	12	1.1116	20	1.2007		
6	1.0528	14	1.1327	25	1.2629		
8	1.0716	16	1.1547	30	1.3312		

ZnI₂ [GS] (366, 369, 507)

%	0°C	20°C	40°C	60°C	80°C	100°C
2	1.018	1.016	1.010	1.000	0.989	0.975
4	1.036	1.034	1.028	1.018	1.006	0.992
6	1.055	1.053	1.046	1.036	1.023	1.009
8	1.075	1.072	1.064	1.054	1.041	1.027
10	1.095	1.091	1.084	1.073	1.059	1.045
12	1.115	1.111	1.103	1.092	1.078	1.063
14	1.136	1.131	1.122	1.111	1.097	1.081
16	1.158	1.152	1.142	1.131	1.117	1.100
18	1.180	1.174	1.164	1.152	1.138	1.121
20	1.204	1.197	1.187	1.174	1.159	1.142
25	1.266	1.258	1.247	1.233	1.216	1.198
30	1.335	1.325	1.312	1.297	1.279	1.260
35	1.410	1.398	1.383	1.367	1.348	1.327
40	1.491	1.478	1.461	1.443	1.423	1.401
45	1.581	1.566	1.547	1.527	1.506	1.483
50	1.680	1.663	1.643	1.621	1.598	1.574
55	1.791	1.770	1.749	1.725	1.701	1.675
60	1.916	1.893	1.870	1.844	1.818	1.790
65	2.061	2.036	2.010	1.982	1.954	1.925
70	2.230	2.202	2.173	2.143	2.113	2.082
75	2.424	2.393	2.361	2.328	2.296	2.263

ZnSO₄ [GS] (200, 203, 247, 342, 348, 375, 655); (18, 20, 89, 105, 116, 184, 192, 220, 221, 278, 322, 329, 344, 349, 401, 402, 425, 449, 462, 464, 466, 506, 533, 535, 618, 628, 629)**

%	0°C	10°C	20°C	30°C	40°C	50°C
2	1.0212	1.0208	1.0190	1.0163	1.0126	1.0084
4	1.0431	1.0423	1.0403	1.0373	1.0335	1.0291
6	1.0654	1.0642	1.0620	1.0588	1.0549	1.0503
8	1.0882	1.0867	1.0842	1.0808	1.0769	1.0721
10	1.1117	1.1098	1.1071	1.1035	1.0996	1.0946
12	1.1360	1.1338	1.1308	1.1270	1.1230	1.1179
14	1.1610	1.1585	1.1553	1.1513	1.1471	1.1421
16	1.1867	1.1840	1.1806	1.1764	1.1721	1.1670

%	d_4^{60}	d_4^{70}	d_4^{80}	%	d_4^{18}	$d_4^{25} \dagger$
2	1.0034	0.9978	0.9918	2	1.0194	1.0178
4	1.0240	1.0183	1.0122	4	1.0407	1.0389
6	1.0451	1.0394	1.0330	6	1.0624	1.0605
8	1.0668	1.0610	1.0545	8	1.0847	1.0825
10	1.0892	1.0833	1.0767	10	1.1077	1.1054
12	1.1124	1.1063	1.0996	12	1.1315	1.1290
14	1.1364	1.1301	1.1232	14	1.1560	1.1534
16	1.1612	1.1547	1.1477	16	1.1813	1.1786

%	18	20	25	30	35
d_4^{18}	1.2074	1.2343	1.3058	1.3834	1.4672

\dagger With 36.28 %, $d_4^{25} = 1.4858$; with 36.69 %, $d_4^{25} = 1.4924$.

% (373)	$d_4^{20.004}$	% (373)	$d_4^{20.004}$
0.00	0.998 23150 \dagger	0.05	0.998 76084
0.01	0.998 33798	0.06	0.998 86596
0.02	0.998 44412	0.07	0.998 97091
0.03	0.998 54995	0.08	0.999 07571
0.04	0.998 65551		

\dagger The small figures are significant only for ratios within the table.

Zn(NO₃)₂ [GS] (288); (20, 469)*; (150, 208, 322, 628, 629)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0154	10	1.0859	18	1.1652	35	1.3678
4	1.0322	12	1.1048	20	1.1865	40	1.4378
6	1.0496	14	1.1244	25	1.2427	45	1.5134
8	1.0675	16	1.1445	30	1.3029	50	1.5944

Zn(C₂H₃O₂)₂, Acetate [JAB] (192); (329)**

%	$d_4^{23.5}$	%	$d_4^{23.5}$	%	$d_4^{23.5}$	%	$d_4^{23.5}$
1	1.004	6	1.040	12	1.082	18	1.124
2	1.011	8	1.054	14	1.096	20	1.137
4	1.026	10	1.068	16	1.110	22	1.151

CdCl₂ [GS] (48, 291, 367); (249, 440, 507)*; (261, 312, 313, 366, 378, 417.5, 451, 459, 618, 628, 629, 641)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0179	1.0175	1.0159	1.0146	1.0131	1.0094
4	1.0364	1.0358	1.0339	1.0325	1.0309	1.0271
6	1.0554	1.0545	1.0524	1.0509	1.0492	1.0453
8	1.0750	1.0737	1.0715	1.0699	1.0681	1.0640
10	1.0952	1.0936	1.0912	1.0895	1.0877	1.0834
12	1.1161	1.1141	1.1115	1.1098	1.1078	1.1034
14	1.1377	1.1353	1.1324	1.1307	1.1286	1.1239
16	1.1598	1.1571	1.1540	1.1522	1.1500	1.1451
18	1.1825	1.1796	1.1762	1.1743	1.1719	1.1668
20	1.2059	1.2029	1.1992	1.1970	1.1945	1.1892
25	1.2687	1.2648	1.2604	1.2580	1.2551	1.2492
30	1.3370	1.3324	1.3273	1.3246	1.3213	1.3147
35	1.4122	1.4068	1.4010	1.3979	1.3943	1.3870
40	1.4961	1.4899	1.4833	1.4797	1.4759	1.4679
45	1.5893	1.5823	1.5748	1.5706	1.5668	1.5582
50	1.6921	1.6845	1.6762	1.6719	1.6676	1.6582

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0051	1.0002	0.9946	0.9885	0.9819	0.9748
4	1.0227	1.0176	1.0119	1.0056	0.9989	0.9916
6	1.0407	1.0354	1.0296	1.0231	1.0163	1.0089
8	1.0592	1.0538	1.0478	1.0412	1.0342	1.0266
10	1.0783	1.0728	1.0666	1.0599	1.0527	1.0449
12	1.0981	1.0924	1.0860	1.0792	1.0719	1.0639
14	1.1185	1.1126	1.1060	1.0991	1.0916	1.0835
16	1.1394	1.1334	1.1266	1.1195	1.1118	1.1036
18	1.1610	1.1548	1.1478	1.1405	1.1326	1.1243
20	1.1832	1.1768	1.1697	1.1621	1.1540	1.1456
25	1.2427	1.2357	1.2280	1.2199	1.2114	1.2026
30	1.3076	1.3000	1.2918	1.2832	1.2741	1.2650
35	1.3793	1.3710	1.3622	1.3530	1.3434	1.3338
40	1.4594	1.4506	1.4411	1.4314	1.4212	1.4111
45	1.5490	1.5394	1.5293	1.5190	1.5082	1.4976
50	1.6484	1.6381	1.6273	1.6164	1.6050	1.5939

Cd(ClO₃)₂ [GS] (288); (602)***

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0147	10	1.0839	18	1.1620	35	1.368
4	1.0313	12	1.1025	20	1.1831	40	1.441
6	1.0483	14	1.1217	25	1.2394		
8	1.0659	16	1.1415	30	1.301		

CdBr₂ [GS] (291, 368); (249, 313, 440)*; (204, 259, 312, 366, 378, 507, 618, 641)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0179	1.0175	1.0158	1.0146	1.0131	1.0094
4	1.0364	1.0358	1.0339	1.0326	1.0310	1.0272
6	1.0554	1.0546	1.0524	1.0510	1.0494	1.0455
8	1.0749	1.0739	1.0714	1.0700	1.0683	1.0643
10	1.0950	1.0937	1.0910	1.0895	1.0877	1.0836
12	1.1158	1.1141	1.1112	1.1097	1.1077	1.1034
14	1.1372	1.1353	1.1322	1.1306	1.1285	1.1239
16	1.1594	1.1573	1.1540	1.1523	1.1501	1.1453
18	1.1825	1.1801	1.1766	1.1747	1.1725	1.1675
20	1.2064	1.2037	1.2000	1.1979	1.1955	1.1904
25	1.2683	1.2648	1.2605	1.2583	1.2555	1.2498
30	1.3377	1.3334	1.3286	1.3259	1.3229	1.3165
35	1.4155	1.4105	1.4049	1.4017	1.3984	1.3913
40			1.4902	1.4866	1.4829	1.4752

CdBr₂—(Continued)

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0052	1.0002	0.9947	0.9886	0.9820	0.9749
4	1.0228	1.0176	1.0120	1.0058	0.9991	0.9918
6	1.0409	1.0355	1.0279	1.0234	1.0165	1.0092
8	1.0595	1.0540	1.0479	1.0414	1.0344	1.0271
10	1.0786	1.0730	1.0667	1.0600	1.0529	1.0455
12	1.0983	1.0925	1.0861	1.0793	1.0720	1.0645
14	1.1187	1.1127	1.1062	1.0993	1.0918	1.0841
16	1.1399	1.1337	1.1271	1.1200	1.1124	1.1045
18	1.1618	1.1656	1.1488	1.1414	1.1337	1.1256
20	1.1846	1.1782	1.1712	1.1637	1.1558	1.1476
25	1.2435	1.2365	1.2291	1.2212	1.2129	1.2043
30	1.3096	1.3021	1.2942	1.2858	1.2771	1.2681
35	1.3838	1.3758	1.3673	1.3583	1.3491	1.3396
40	1.4670	1.4583	1.4491	1.4396	1.4297	1.4197

CdI₂ [GS] (151, 249, 312, 313, 369)**; (2, 204, 366, 440)*; (18, 378, 507, 618, 641)

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0173	1.0169	1.0153	1.0141	1.0127	1.0090
4	1.0351	1.0345	1.0328	1.0314	1.0300	1.0263
6	1.0533	1.0525	1.0507	1.0492	1.0478	1.0439
8	1.0719	1.0710	1.0690	1.0675	1.0660	1.0620
10	1.0911	1.0900	1.0879	1.0863	1.0847	1.0805
12	1.1110	1.1098	1.1075	1.1058	1.1042	1.0997
14	1.1317	1.1303	1.1278	1.1261	1.1244	1.1198
16	1.1532	1.1516	1.1489	1.1471	1.1454	1.1406
18	1.1755	1.1737	1.1709	1.1690	1.1672	1.1622
20	1.1987	1.1967	1.1937	1.1917	1.1898	1.1846
25	1.2608	1.2583	1.2546	1.2524	1.2501	1.2446
30			1.3219	1.3194	1.3167	1.3107
35			1.3967	1.3938	1.3908	1.3841
40			1.4801	1.4767	1.4734	1.4660
45			1.5726	1.5689	1.5651	1.5571

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0048	0.9998	0.9943	0.9882	0.9815	0.9746
4	1.0219	1.0167	1.0112	1.0049	0.9981	0.9911
6	1.0393	1.0340	1.0285	1.0220	1.0150	1.0079
8	1.0572	1.0517	1.0461	1.0394	1.0323	1.0251
10	1.0756	1.0700	1.0642	1.0574	1.0502	1.0429
12	1.0947	1.0890	1.0830	1.0761	1.0687	1.0613
14	1.1146	1.1087	1.1026	1.0955	1.0879	1.0805
16	1.1352	1.1292	1.1229	1.1157	1.1079	1.1004
18	1.1567	1.1504	1.1440	1.1366	1.1287	1.1210
20	1.1789	1.1725	1.1658	1.1584	1.1502	1.1424
25	1.2384	1.2315	1.2243	1.2165	1.2080	1.1997
30	1.3040	1.2967	1.2888	1.2805	1.2716	1.2628
35	1.3769	1.3691	1.3606	1.3518	1.3425	1.3331
40	1.4582	1.4498	1.4408	1.4313	1.4214	1.4114
45	1.5485	1.5393	1.5298	1.5196	1.5090	1.4983

CdSO₄ [GS] (249, 313, 655)**; (115, 440)*; (20, 116, 312, 322, 329, 378, 451, 550, 618, 629)

%	d_4^{18}	d_4^{30}	%	d_4^{18}	d_4^{30}	(477)**; (641)*
2	1.0182	1.0149	18	1.1982	1.1941	% d_4^{18}
4	1.0383	1.0348	20	1.2243	1.2201	0.2 1.00068
6	1.0590	1.0552	25	1.2940	1.2897	0.4 1.00259
8	1.0803	1.0766	30	1.3714	1.3662	0.6 1.00454
10	1.1023	1.0986	35	1.4551	1.4511	0.8 1.00654
12	1.1250	1.1213	40	1.5470	1.5445	1.0 1.00859
14	1.1485	1.1447	45		1.6477	
16	1.1729	1.1689				

Cd(NO₃)₂ [GS] (249)**; (440)*; (208, 318, 322, 378, 618, 628, 629, 641)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0154	10	1.0869	18	1.1682	35	1.3822
4	1.0326	12	1.1061	20	1.1904	40	1.4590
6	1.0502	14	1.1261	25	1.2488	45	1.5438
8	1.0683	16	1.1468	30	1.3124	50	1.6356

Cd(CHO₂)₂, Formate [JAB]; with 9.42%, $d_4^{21.6} = 1.0761$ (329)HgCl₂ [GS] (552, 602)**; (106)*; (49, 224, 249, 378, 417.5, 511, 517, 550, 628, 629)

%	0°C	10°C	20°C	25°C	30°C
1	1.00821	1.00806	1.00653	1.00534	1.00391
2	1.01676	1.01657	1.01499	1.01378	1.01232
3	1.02547	1.02524	1.02359	1.02234	1.02085
4	1.03429	1.03400	1.03229	1.03100	1.02947
5	1.04319	1.04282	1.04105	1.03973	1.03815

Hg(ClO₃)₂ [GS] (602)|| HgBr₂ [GS] (249) || Hg₂SO₄ [GS] (602)

%	d_4^{15}	%	d_4^{18}	%	d_4^{15}
1	1.0080	0.223	1.0007	0.070	0.99985
2	1.0170	0.422	1.0025		
3	1.0260				

Hg(CN)₂ [GS] (76, 378, 511, 550)|| Hg(C₂H₃O₂)₂, Acetate [JAB] (329)

%	d_4^{20}	%	d_4^{22}
2	1.0138	21.03	1.1656
4	1.0298		
6	1.0461		
8	1.0629		

CuCl₂ [WCS] (110, 288)**; (105, 192, 225)*; (27, 45, 106, 162, 178, 182, 206, 208, 261, 270, 278, 298, 308, 319, 323, 451, 462, 462.5, 548, 604, 629)

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.0095	1.0087	1.0072	1.0062	1.005	1.002
2	1.0191	1.019	1.0171	1.0159	1.0143	1.0101
4	1.0387	1.038	1.036	1.0346	1.0331	1.0305
6	1.0586	1.0579	1.0555	1.054	1.0522	1.048
8	1.0788	1.078	1.0754	1.0736	1.0718	1.0682
10	1.0996	1.0985	1.0956	1.0938	1.0918	1.0875
12	1.1208	1.1196	1.1165	1.1145	1.1124	1.107
14	1.1427	1.1415	1.1377	1.1357	1.1335	1.1285
16	1.1653	1.164	1.1595	1.1575	1.1552	1.151
18	1.1884	1.1866	1.182	1.1797	1.1776	1.173
20	1.2121	1.2102	1.2052	1.203	1.2004	1.1953

%	0°C	%	50°C	60°C
25	1.2737	1	0.998	0.9945
30	1.3396	2	1.0064	1.001
35	1.4114	4	1.0275	1.0245

Cu(ClO₃)₂ [WCS] (288)**; (602)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0068	8	1.0667	16	1.1424	30	1.2993
2	1.0150	10	1.0847	18	1.1629		
4	1.0318	12	1.1033	20	1.1840		
6	1.0489	14	1.1224	25	1.2393		

CuBr₂ [WCS] (45)

%	d_4^0	%	d_4^0	%	d_4^0	%	d_4^0
0.2	1.004	0.6	1.011	1.0	1.018	4.0	1.072
0.4	1.007	0.8	1.014	2.0	1.036	6.0	1.113

CuSO₄ [WCS] (299, 313, 342, 344, 619)**; (11, 105, 184, 220, 221, 224, 264, 308)*; (106, 144, 162, 175, 189, 192, 203, 206, 225, 246, 270, 275, 278, 329, 377, 400, 403, 404, 406, 425, 449, 451, 462, 462.5, 506, 533, 534, 535, 572, 580, 595, 604, 629)

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.0104	1.010	1.0086	1.0073	1.0058	1.0024
2	1.0211	1.0206	1.019	1.0176	1.0161	1.0126
4	1.0429	1.042	1.0401	1.0387	1.037	1.0332
6	1.0654	1.0638	1.0616	1.0602	1.0585	1.0545
8	1.0887	1.0866	1.084	1.0825	1.0807	1.0764
10	1.1128	1.1101	1.1071	1.1054	1.1035	1.0990
12	1.1379	1.1345	1.1308	1.1289	1.1267	1.1222
14		1.1590	1.1544			
16		1.183	1.180			
18		1.208	1.206			

Cu(NO₃)₂ [WCS] (288)**; (323, 384, 488, 629)*; (106, 162, 164, 194, 208, 217, 270, 308, 319, 329, 462, 462.5)

%	d_4^{15}	d_4^{20}	d_4^{25}	%	d_4^{15}	d_4^{20}
1	1.0078	1.0065	1.0050	14	1.1283	1.1260
2	1.0159	1.015	1.0128	16	1.1485	1.1468
4	1.0334	1.0320	1.0297	18	1.170	1.1678
6	1.0520	1.0500	1.0475	20	1.192	1.1893
8	1.0700	1.0685	1.0655	25	1.248	1.2475
10	1.0885	1.0875		30	1.310	
12	1.1085	1.1065		35	1.377	

(NH₄)₂Cu(SO₄)₂ [WCS]; 7.73%, $d_4^{19.1} = 1.0243$ (506); cf. (534)
Cu(CHO₂)₂, Formate [WCS] (434, 563)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{30}
0.2	1.0002	0.8	1.0048	4.0	1.0297	3.7	1.0166
0.4	1.0017	1.0	1.0064				
0.6	1.0033	2.0	1.0142				

Cu(C₂H₃O₂)₂, Acetate [WCS] (291)**; (563)*; (288)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
0.2	0.9997	0.6	1.0020	1.0	1.0046	4.0	1.0223
0.4	1.0008	0.8	1.0032	2.0	1.0106	6.0	1.0340

Cu(C₃H₅O₂)₂, Propionate [WCS] (563)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
0.2	0.9997	0.6	1.0017	1.0	1.0038	4.0	1.0192
0.4	1.0007	0.8	1.0027	2.0	1.0089		

AgF [WCS] (288)**; (251)*

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0088	10	1.1071	20	1.2394	45	1.70
2	1.0191	12	1.1316	25	1.3146	50	1.85
4	1.0399	14	1.1572	30	1.40	55	2.03
6	1.0613	16	1.1837	35	1.48	60	2.26
8	1.0838	18	1.2110	40	1.58	65	2.55

AgClO₃ [WCS] (602)

%	1	2	4	6	8
d_4^{15}	1.0074	1.0158	1.0327	1.0503	1.0683

Ag₂SO₄ [WCS] (262, 295)*; (602) || **Ag₂SeO₄ [WCS]** (602)

%	d_4^{15}	d_4^{25}	%	d_4^{15}
0.59	1.0048		0.18	1.00085
0.83		1.0053		
0.88	1.0076			

AgNO₃ [WCS] (64, 262)**; (291, 530, 531)*; (18, 106, 189, 224, 225, 313, 329, 342, 411, 508, 517, 555, 605, 606, 608, 609, 610, 629)

%	10°C	30°C	40°C	60°C	80°C
2.0	1.0170	1.0127	1.0091	0.9999	0.9885
10.0	1.0908	1.0848	1.0807	1.0706	1.0585
70.0		2.2234	2.2131	2.1924	2.1709

AgNO₃—(Continued)

%	d_4^{20}	d_4^{25}	$d_4^{100} \dagger$	%	d_4^{20}	d_4^{25}	$d_4^{100} \dagger$
0.2		0.9988		20.0	1.1942	1.1918	1.143
0.4		1.0006		25.0	1.2545	1.2525	1.201
0.6		1.0023		30.0	1.3205	1.3185	1.263
0.8		1.0040		35.0	1.3931	1.3905	1.333
1.0	1.0070	1.0057	0.966	40.0	1.4743	1.469	1.410
2.0	1.0154	1.0141	0.974	45.0	1.565	1.557	1.508
4.0	1.0327	1.0315	0.990	50.0	1.668	1.659	1.611
6.0	1.0506	1.0491	1.007	55.0	1.786	1.779	1.724
8.0	1.0690	1.0674	1.025	60.0	1.916	1.912	1.852
10.0	1.0882	1.0866	1.043	65.0		2.06	1.992
12.0	1.1080	1.105	1.062	70.0	2.2333	2.2283	2.151
14.0	1.1284	1.125	1.08	75.0			2.345
16.0	1.1495	1.146	1.10	80.0			2.570
18.0	1.1715	1.168	1.12	85.0			2.838

† With 0.423%, $d_4^{155.6} = 0.9160$, $d_4^{217.6} = 0.8481$; with 0.843%, $d_4^{306} = 0.7068$; with 1.675%, $d_4^{155.8} = 0.9264$, $d_4^{218.1} = 0.8581$ (455).

AgC₂H₃O₂, Acetate [WCS]; with 1%, $d_4^{15} = 1.0059$; $d_4^{25} = 1.0020$ (295, 602)

AgC₂H₂ClO₂, Chloroacetate [WCS]; with 1.51%, $d_4^{25} = 1.0066$ (295)
AgTi (NO₃)₂ [WCS] (508)

%	d_4^{100}	%	d_4^{100}	%	d_4^{100}	%	d_4^{100}
1	0.966	14	1.080	40	1.436	75	2.435
2	0.974	16	1.100	45	1.533	80	2.686
4	0.990	18	1.122	50	1.637	85	3.008
6	1.006	20	1.144	55	1.748	90	3.425
8	1.024	25	1.204	60	1.867	95	3.964
10	1.042	30	1.272	65	2.036	100	4.658
12	1.060	35	1.349	70	2.224		

AuCl₃ [WCS]

%	d_4^{15} (602)†	d_4^{17} (158)	%	d_4^{15} (602)†	d_4^{17} (158)
1	1.0060	1.0072	6	1.0434	1.0460
2	1.0132	1.0156	8	1.0591	
4	1.0281	1.0312	10	1.0750	

† Solutions contained 1 mole HCl per mole AuCl₃.

Au(CN)₃ [WCS]; with 2.643%, $d_4^{19.5} = 1.0181$ (76)

OsO₄ [WCS]; with 1.316%, $d_4^{19} = 1.0061$ (76)

PtCl₄ [WCS] (397, 433, 497)

%	d_4^{room}	%	d_4^{room}	%	d_4^{room}	%	d_4^{room}
1	1.008	10	1.095	20	1.212	45	1.663
2	1.017	12	1.117	25	1.283	50	1.782
4	1.035	14	1.139	30	1.360		
6	1.054	16	1.163	35	1.448		
8	1.074	18	1.186	40	1.543		

PdCl₂ [WCS]; $d_4^{19} = 1.0022$ with 0.37%; $d_4^{20} = 1.0157$ with 2.193%;
 $= 1.0224$ with 3.00% (76, 602)

HMnO₄ [LJG]; with 6.00%, $d_4^{25} = 1.0354$ (529)

MnCl₂ [JAB] (291, 629)**; (225, 278, 312, 384, 561) [LJG]

%	d_4^{18}	d_4^{25}	%	d_4^{18}	%	d_4^{18}
1	1.0069	1.0055	12	1.1046	24	1.2283
2	1.0153	1.0139	14	1.1238	26	1.2511
4	1.0324	1.0309	16	1.1435	28	1.2746
6	1.0498	1.0482	18	1.1638	30	1.2988
8	1.0676		20	1.1846		
10	1.0859		22	1.2061		

MnBr₂ [JAB] (291) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0071	10	1.0886	20	1.1942	30	1.3206
2	1.0157	12	1.1083	22	1.2176	32	1.3489
4	1.0332	14	1.1287	24	1.2419		
6	1.0511	16	1.1498	26	1.2672		
8	1.0695	18	1.1716	28	1.2934		

MnSO₄ [JAB] (105, 225, 278); (629)*; (144, 192, 206, 221, 312, 477, 550, 561) [LJG]**

%	0°C	10°C	15°C	20°C	25°C
1	1.0100	1.0098	1.0089	1.0080	1.0068
2	1.0202	1.0197	1.0188	1.0178	1.0165
4	1.0409	1.0399	1.0389	1.0378	1.0364
6	1.0620	1.0606	1.0595	1.0583	1.0569
8	1.0836	1.0819	1.0807	1.0794	1.0780
10	1.1057	1.1036	1.1025	1.1012	1.0998
12	1.1282	1.1259	1.1248	1.1236	1.1224
14	1.1511	1.1488	1.1478	1.1467	1.1458
16	1.1744	1.1723	1.1714	1.1705	1.1699
18	1.1982	1.1965	1.1956	1.1950	1.1948

%	20	22	24	26	28	30
15°C	1.2205	1.2461	1.2725	1.2997	1.3277	1.3565
25°C†	1.2203	1.2464	1.2731	1.3004	1.3283	1.3568

† $d_4^{25} = 1.3860$ with 32 %.

Mn(NO₃)₂ [JAB] (291); (225, 278, 469, 629) [LJG]**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0063	12	1.0969	24	1.2125	45	1.4662
2	1.0140	14	1.1149	26	1.2338	50	1.5378
4	1.0298	16	1.1333	28	1.2557	55	1.6146
6	1.0459	18	1.1522	30	1.2781		
8	1.0624	20	1.1717	35	1.3367		
10	1.0794	22	1.1918	40	1.3993		

NH₄MnO₄ [LJG]; with 3.43 %, $d_4^{25} = 1.0154$ (529)

Mn(C₂H₃O₂)₂, Acetate [JAB] (509)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0033	8	1.0398	16	1.0827	24	1.1288
2	1.0085	10	1.0503	18	1.0939	26	1.1410
4	1.0189	12	1.0609	20	1.1053	28	1.1536
6	1.0293	14	1.0717	22	1.1169	30	1.1666

Fe(OH)₃, Dialyzed [WCS] (198, 377)

%	d_4^{20}	d_4^{25}	%	d_4^{20}	d_4^{25}	%	d_4^{20}
1	1.0050	1.0040	2	1.0121	1.0105	3	1.0194

FeCl₂ [WCS] (27, 45, 163, 225, 291, 506)

%	$d_4^{15.5}$	d_4^{18}	%	$d_4^{15.5}$	d_4^{18}	%	$d_4^{15.5}$	d_4^{18}
1	1.0080	1.0075	10	1.0940	1.0923	* 20	1.2020	1.1996
2	1.0172	1.0165	12	1.1145	1.1126	25	1.2610	1.2596
4	1.0356	1.0348	14	1.1355	1.1336	30	1.3275	
6	1.0545	1.0535	16	1.1575	1.1551	35	1.4020	
8	1.0738	1.0726	18	1.1795	1.1771			

FeCl₃ [WCS] (291); (27, 208, 254, 279, 319, 328, 430, 506, 554)**

%	0°C	10°C	15°C	20°C	25°C	30°C
1	1.0086	1.0084	1.0078	1.0068	1.0053	1.0040
2	1.0174	1.0168	1.0162	1.0152	1.0137	1.0122
4	1.0347	1.0341	1.0335	1.0324	1.0309	1.0292
6	1.0520	1.0511	1.0502	1.0492	1.0478	1.0460
8	1.0703	1.0692	1.0681	1.0669	1.0653	1.0636
10	1.0898	1.0883	1.0867	1.0851	1.0835	1.0817
12	1.1088	1.1071	1.1056	1.1040	1.1024	1.1006
14	1.1280	1.1257	1.1242	1.1227	1.1212	1.1196
16	1.1475	1.1449	1.1434	1.1418	1.1402	1.1386
18	1.1670	1.1644	1.1631	1.1617	1.1602	1.1586
20	1.1870	1.1847	1.1834	1.1820	1.1805	1.1786
25	1.2400	1.2380	1.2360	1.2340	1.2320	1.2290
30	1.2970	1.2950	1.2935	1.2910	1.2885	1.2850
35	1.3605	1.3580	1.3555	1.3530	1.3505	1.3475
40	1.4280	1.4235	1.4205	1.4175	1.4145	1.4115
45		1.4920	1.4885	1.4850		
50		1.5610	1.5560	1.5510		

FeCl₃—(Continued)

%	d_4^{35}	%	d_4^{35}	%	d_4^{35}	%	d_4^{35}
1	1.0025	8	1.0617	16	1.1370	30	1.2820
2	1.0107	10	1.0799	18	1.1569	35	1.3450
4	1.0272	12	1.0990	20	1.1767	40	1.4085
6	1.0441	14	1.1180	25	1.2260		

FeBr₂ [WCS] (291)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0076	8	1.0728	16	1.1576	30	1.3393
2	1.0166	10	1.0929	18	1.1807	35	1.4186
4	1.0347	12	1.1138	20	1.2047		
6	1.0534	14	1.1353	25	1.2685		

FeBr₃ [WCS]; with 1.56 %, $d_4^{19} = 1.0107$; 8.016 %, $d_4^{20} = 1.0640$ (76)

FeSO₄ [WCS] (220, 221, 334, 477)*; (18, 270, 404, 406, 449, 506, 533, 535, 595, 604)

%	18°C	20°C	%	15°C	18°C	%	15°C	18°C
0.2	1.00068	1.0002	2	1.0185	1.0180	12	1.1235	1.1220
0.4	1.00275	1.0022	4	1.0380	1.0375	14	1.1460	1.1445
0.6	1.00463	1.0042	6	1.0580	1.0575	16	1.1690	1.1675
0.8	1.00645	1.0062	8	1.0790	1.0785	18	1.1920	1.1905
1†	1.0085	1.0082	10	1.1010	1.1000	20	1.2150	1.2135

† For 1 %, $d_4^{15} = 1.0090$.

Fe₂(SO₄)₃† [WCS] (208)*; (225, 254, 377)

%	d_4^{15} (225)	$d_4^{17.5}$ (208)*	d_4^{18} (254)	%	d_4^{15} (225)	$d_4^{17.5}$ (208)*	d_4^{18} (254)
1	1.008	1.0072	1.0066	20	1.204	1.1811	1.2061
2	1.018	1.0157	1.0156	25	1.264	1.2410	1.2689
4	1.037	1.0327	1.0346	30	1.330	1.3073	1.3347
6	1.056	1.0498	1.0554	35	1.400	1.3764	1.4085
8	1.076	1.0670	1.0754	40	1.476	1.4487	1.4873
10	1.095	1.0840	1.0954	45	1.560	1.5278	
12	1.116	1.1028	1.1164	50	1.647	1.6127	
14	1.137	1.1215	1.1382	55		1.7028	
16	1.158	1.1409	1.1602	60		1.7983	
18	1.181	1.1609	1.1822				

† Discordant data. For data at 20°C, v. (377).

Fe(NO₃)₂ [WCS] (217, 602)

%	1	2	4	6
d_4^{20}	1.0063	1.0144	1.0309	1.0480

Fe(NO₃)₃ [WCS] (291); (208, 319, 602)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0065	6	1.0468	12	1.0989	18	1.1551
2	1.0144	8	1.0636	14	1.1172	20	1.1748
4	1.0304	10	1.0810	16	1.1359	25	1.2281

FeSO₄·(NH₄)₂SO₄ [WCS] (199, 533, 534)*; (221, 506)

%	1	2	4	6	8
$d_4^{16.5}$	1.0078	1.0159	1.0323	1.0485	1.0654
d_4^{25}	1.005	1.013	1.029	1.045	1.062
%	10	12	14	16	18
$d_4^{16.5}$	1.0827	1.1002	1.1182	1.1362	1.1547
d_4^{25}	1.080	1.098	1.116		

Fe₂(SO₄)₃·(NH₄)₂SO₄ [WCS] (225)*; (188)

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0072	6	1.0498	12	1.1038	18	1.1609
2	1.0157	8	1.0675	14	1.1224	20	1.1809
4	1.0324	10	1.0856	16	1.1412	40	1.3799

Fe₂(C₂O₄)₃, Oxalate [WCS]; with 3.04 %, $d_4^{30.1} = 1.0126$; with 23.85 %, $d_4^{30.0} = 1.1480$ (434)

CoCl₂† [WCS] (291); (66, 629)*; (45, 76, 162, 178, 192, 208, 225, 319, 323, 397, 433, 451, 506, 604, 640)**

%	1	2	4	6	8	10
d_4^{18}	1.0076	1.0168	1.0356	1.0549	1.0747	1.0949
d_4^{20}	1.0073	1.0165	1.0350	1.0538	1.0735	1.0940
d_4^{25}	1.0060	1.0150	1.0335	1.0525		

%	12	14	16	18	20
d_4^{18}	1.1157	1.1370	1.1590	1.1817	1.2051
d_4^{20}	1.1150	1.1365	1.1585	1.1815	1.2050

† Data on this salt, especially at higher concentrations, are rather discordant.

Co(ClO₃)₂ [WCS] (291); (421)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0064	8	1.0642	16	1.1373	30	1.2880
2	1.0144	10	1.0817	18	1.1569	35	1.3503
4	1.0305	12	1.0996	20	1.1772	40	1.4182
6	1.0472	14	1.1182	25	1.2305		

CoBr₂ [WCS] (291)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0075	8	1.0735	16	1.1592	30	1.3437
2	1.0165	10	1.0938	18	1.1826		
4	1.0350	12	1.1148	20	1.2069		
6	1.0539	14	1.1367	25	1.2718		

CoSO₄ [WCS] (105, 162, 435, 449, 506, 629)

%	1	2	4†	6	8
d_4^{20}	1.0107	1.0215	1.0436	1.0662	1.0890
d_4^{25}	1.0072	1.0174	1.0380	1.0588	1.0800

† With 4 %, $d_4^{20} = 1.0411$.**Co(NO₃)₂ [WCS] (291)**; (602, 629)*; (162, 206, 208, 217, 319, 323)**

%	d_4^{18}	d_4^{20}	d_4^{25}	%	d_4^{18}	d_4^{20}
1	1.0068	1.0064	1.0054	14	1.1229	1.1220
2	1.0150	1.0145	1.0135	16	1.1427	1.1420
4	1.0317	1.0315	1.0304	18	1.1632	1.1630
6	1.0488	1.0485	1.0475	20	1.1841	1.1840
8	1.0666	1.0660	1.0648	25	1.2396	1.2390
10	1.0848	1.0840		30	1.2998	1.2990
12	1.1036	1.1030				

CoSO₄·(NH₄)₂SO₄ [WCS]; with 12.64 %, $d_4^{19 \pm 1} = 1.104$ (506)**Co(C₂H₃O₂)₂, Acetate [JAB] (509)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.006	3	1.020	5	1.031	7	1.040
2	1.013	4	1.026	6	1.036		

Co(CNS)₂ [WCS] (640)

%	$d_4^{0.2}$	d_4^{95}	%	$d_4^{0.2}$	d_4^{95}	%	$d_4^{0.2}$	d_4^{95}
1	1.0062	0.9695	8†	1.0575	1.0180	16	1.1255	1.0810
2	1.0128	0.9763	10	1.0735	1.0325	18	1.1440	1.0990
4	1.0270	0.9903	12	1.0900	1.0480	20	1.1635	1.1175
6	1.0420	1.0040	14	1.1075	1.0640	25	1.2155	1.1665

† With 8.07 %, $d_4^{25} = 1.0552$.**NiCl₂ [WCS] (291)**; (66, 629)*; (27, 45, 162, 192, 208, 225, 319, 397, 431, 433, 451, 506)**

%	d_4^{18}	d_4^{20}	d_4^{25}	%	d_4^{18}	d_4^{20}
1	1.0082	1.0078	1.0060	14	1.1442	1.1434
2	1.0179	1.0175	1.0152	16	1.1674	1.1665
4	1.0375	1.0370	1.0345	18	1.1915	1.1905
6	1.0577	1.0571	1.0545	20	1.2163	1.2150
8	1.0785	1.0777		25		1.2800
10	1.0998	1.0990		30		1.3525
12	1.1217	1.1209				

Ni(ClO₃)₂ [WCS] (291)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0068	8	1.0664	16	1.1426	30	1.2999
2	1.0150	10	1.0846	18	1.1631		
4	1.0317	12	1.1033	20	1.1842		
6	1.0488	14	1.1227	25	1.2399		

NiBr₂ [WCS] (291)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0078	8	1.0758	16	1.1648	30	1.3565
2	1.0170	10	1.0969	18	1.1889		
4	1.0359	12	1.1188	20	1.2140		
6	1.0555	14	1.1414	25	1.2815		

NiSO₄ [WCS] (105, 334, 406.5, 629)*; (76, 162, 192, 206, 225, 431, 449, 506)

%	d_4^{18}	d_4^{20}	d_4^{25}	%	d_4^{18}
1	1.0107	1.0091	1.0089	10	1.1085
2	1.0215	1.0198	1.0196	12	1.1325
4	1.0435	1.0415	1.0413	14	1.1575
6		1.0630	1.0625	16	1.1825
8		1.0852		18	1.2090

Ni(NO₃)₂† [WCS] (291); (76, 162, 192, 208, 225, 319, 323, 602, 629)**

%	d_4^{18}	d_4^{20}	d_4^{25}	%	d_4^{18}	d_4^{20}	d_4^{25}
1	1.0070	1.0065	1.0055	14	1.1277	1.1270	1.1230
2	1.0155	1.0150	1.0141	16	1.1484	1.1480	1.1430
4	1.0330	1.0325	1.0316	18	1.1696	1.1690	1.1640
6	1.0508	1.0503	1.0494	20	1.1914	1.1910	1.1860
8	1.0693	1.0688	1.0675	25	1.2493	1.2490	1.2430
10	1.0882	1.0877	1.0850	30	1.3114	1.3110	1.3040
12	1.1076	1.1070	1.1040	35	1.3777	1.3770	1.3700

† The 18°C values are considered more reliable than the 20°C values, which are in the main derived from the former.

NiSO₄·(NH₄)₂SO₄ [WCS]; with 4.89 %, $d_4^{19 \pm 1} = 1.041$ (506)**CrO₃ [JAB] (661)**; (138, 224, 463, 517) [LJG]**

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.006	12	1.093	24	1.200	45	1.435
2	1.014	14	1.110	26	1.220	50	1.505
4	1.030	16	1.127	28	1.240	55	1.581
6	1.045	18	1.145	30	1.260	60	1.663
8	1.060	20	1.163	35	1.313		
10	1.076	22	1.181	40	1.371		

CrCl₃ [JAB] (291) [LJG]

d_4^{18}			
%	"Violet"	"Green"	Equilibrium mixture "violet" and "green"
1	1.0076	1.0071	1.0075
2	1.0166	1.0157	1.0165
4	1.0349	1.0332	1.0347
6	1.0535	1.0510	1.0533
8	1.0724	1.0691	1.0722
10	1.0917	1.0876	1.0915
12	1.1114	1.1065	1.1111
14	1.1316		

CrBr₃ [JAB] (291) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0074	8	1.0726	16	1.1565	24	1.2532
2	1.0162	10	1.0926	18	1.1794	26	1.2797
4	1.0344	12	1.1132	20	1.2031	28	1.3071
6	1.0532	14	1.1345	22	1.2277	30	1.3355

Cr₂(SO₄)₃ [JAB] (225); (76, 189, 237) [LJG]**

d_4^{15}			d_4^{15}		
%	"Green"	"Violet"	%	"Green"	"Violet"
1	1.0081	1.0091	18	1.1851	1.1966
2	1.0172	1.0191	20	1.2091	1.2218
4	1.0358	1.0395	22	1.2339	1.2479
6	1.0551	1.0604	24	1.2594	1.2750
8	1.0751	1.0817	26	1.2856	1.3032
10	1.0958	1.1034	28	1.3125	1.3325
12	1.1172	1.1257	30	1.3401	
14	1.1392	1.1486	35	1.4123	
16	1.1618	1.1722	40	1.4893	

(NH₄)₂CrO₄ [LJG] (463, 566)

%	°C	d_4^t	%	°C	d_4^t
3.80	20	1.0219	19.75	13.7	1.1189
10.52	13	1.0627	28.04	19.6	1.1707

(NH₄)₂Cr₂O₇ [JAB] (566); (463) [LJG]**

%	d_4^{12}	%	d_4^{12}	%	d_4^{12}	%	d_4^{12}
1	1.0051	6	1.0342	12	1.0715	18	1.1120
2	1.0108	8	1.0463	14	1.0846	20	1.1263
4	1.0223	10	1.0588	16	1.0981		

Cr(NO₃)₃ [JAB] (291, 602) [LJG]**

%	d_4^{15}	d_4^{18}	%	d_4^{15}	d_4^{18}
	"Violet"	Color not stated		"Violet"	Color not stated
1	1.0073	1.0065	16	1.1407	1.1391
2	1.0155	1.0145	18	1.1606	1.1588
4	1.0322	1.0309	20	1.1810	1.1790
6	1.0492	1.0477	22	1.2020	1.1998
8	1.0666	1.0650	24	1.2236	1.2213
10	1.0844	1.0828	26	1.2459	1.2435
12	1.1027	1.1011	28	1.2690	1.2665
14	1.1214	1.1198	30	1.2929	1.2904

(NH₄)₂SO₄·Cr₂(SO₄)₃·24H₂O [JAB] (225); (187, 188) [LJG]**

%	d_4^{15}	d_4^{15}	%	d_4^{15}
Anhyd.	"Violet"	"Green"	Anhyd.	"Green"
1	1.0081	1.007	10	1.082
2	1.0172	1.015	12	1.100
4	1.0357	1.031	14	1.118
6	1.0545	1.048	16	1.137
8		1.065	18	1.156

%	d_4^{15}	%	d_4^{15}
Anhyd.	"Green"	Anhyd.	"Green"
20	1.176	30	1.283
22	1.196	35	1.341
24	1.217	40	1.403
26	1.238	45	1.470
28	1.260	50	1.542

MoO₃ [JAB]; with 1%, $d_4^{20} = 1.0062$ (517) [LJG]**(NH₄)₆Mo₇O₂₄ [JAB] (509, 510)**; (135, 517) [LJG]**

%†	1	2	4	6	8	10
d_4^{20}	1.0055	1.0129	1.0282	1.0440	1.0603	1.0772

† With 23.51%, $d_4^{20} = 1.2019$.**WO₃ [LJG] (532)**

%	$d_4^{17.5}$	%	$d_4^{17.5}$	%	$d_4^{17.5}$	%	$d_4^{17.5}$
1	1.0078	12	1.118	24	1.272	36	1.466
2	1.0170	14	1.141	26	1.301	38	1.505
4	1.0357	16	1.166	28	1.331	40	1.546
6	1.0550	18	1.191	30	1.363	42	1.590
8	1.075	20	1.217	32	1.396	44	1.638
10	1.096	22	1.244	34	1.430		

SiO₂·12MoO₃ [LJG] (13)

%	10°C	20°C	30°C	40°C
2	1.0169	1.0153	1.0126	1.0090
4	1.0345	1.0327	1.0299	1.0262
6	1.0524	1.0505	1.0476	1.0437
8	1.0707	1.0687	1.0657	1.0616
10	1.0894	1.0873	1.0841	1.0799
12	1.1085	1.1063	1.1029	1.0986
14	1.1281	1.1258	1.1223	1.1178
16	1.1482	1.1457	1.1421	1.1375

UO₂Cl₂ [LJG] (122)**UONO₃ [LJG] (117, 124)****UO₂(NO₃)₂ [LJG] (226, 233, 620)**; (27, 76)**

%	d_4^{17}	d_4^{25}	%	d_4^{17}	d_4^{25}	%	d_4^{17}	d_4^{25}
1	1.008	1.0037	20	1.194	1.177	40	1.466	1.455
2	1.017	1.0104	22	1.218	1.201	42	1.498	1.489
4	1.036	1.0242	24	1.243	1.226	44	1.531	1.524
6	1.054	1.039	26	1.269	1.251	46	1.567	1.559
8	1.072	1.055	28	1.295	1.277	48	1.606	1.595
10	1.091	1.072	30	1.322	1.304	50	1.649	1.630
12	1.110	1.091	32	1.349	1.331	52	1.696	
14	1.129	1.111	34	1.377	1.360	54	1.748	
16	1.149	1.132	36	1.406	1.390			
18	1.171	1.154	38	1.436	1.422			

USO₄ [LJG] (119, 121)**(UO)₂SO₄ [LJG] (121)****UO₂(C₂H₃O₂)₂ Acetate [JAB] (509)**

%	1	2	3	4
d_4^{20}	1.0055	1.0129	1.0203	1.0278

NH₄VO₃ [LJG] (602)

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
0.1	0.99973	0.4	1.00154	0.8	1.00401	1.2	1.00653
0.2	1.00033	0.6	1.00277	1.0	1.00526		

H₃BO₃ [JAB] (225); (28, 52, 101, 243) [LJG]**

%	1	2	3
d_4^{15}	1.0045	1.0103	1.0165

AlCl₃ [JAB] (291); (106, 144, 219, 323) [LJG]**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0075	6	1.0526	12	1.1093
2	1.0164	8	1.0711	14	1.1290
4	1.0344	10	1.0900	16	1.1491

AlBr₃ [JAB] (602); (76) [LJG]**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0057	6	1.0451	12	1.0969	18	1.1528
2	1.0133	8	1.0619	14	1.1150	20	1.1725
4	1.0289	10	1.0792	16	1.1336	22	1.1928

Al₂(SO₄)₃ [JAB] (225, 629); (76, 106, 187, 188, 189, 206, 404, 406, 513, 517, 561) [LJG]**

%	d_4^{15}	d_4^{25}	%	d_4^{15}	%	d_4^{15}
1	1.0093	1.0069	10	1.1062	20	1.2272
2	1.0195	1.0167	12	1.1293	22	1.2534
4	1.0404	1.0370	14	1.1529	24	1.2803
6	1.0618	1.0580	16	1.1770	26	1.3079
8	1.0837		18	1.2017		

Al(NO₃)₃ [JAB] (291); (602) [LJG]**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0065	10	1.0811	20	1.1745	30	1.2805
2	1.0144	12	1.0989	22	1.1946	32	1.3036
4	1.0305	14	1.1171	24	1.2153		
6	1.0469	16	1.1357	26	1.2365		
8	1.0638	18	1.1549	28	1.2582		

(NH₄)₂SO₄·Al₂(SO₄)₃ [JAB] (46); (225)* [LJG]**

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0079	8	1.0723	16	1.1541	24	1.2420
2	1.0167	10	1.0919	18	1.1757	26	1.2644
4	1.0348	12	1.1121	20	1.1976	28	1.2870
6†	1.0533	14	1.1329	22	1.2197	30	1.3098

† Solutions above ca. 6 % are supersaturated.

Al(CNS)₃ [LJG]; with 23.30 %; $d_4^{18} = 1.1582$ (155)
Tl₂SO₄·Al₂(SO₄)₃ [JAB]; with 5.39 %, $d_4^{20} = 1.0510$ (378) [LJG]
La₂(SO₄)₃ [LJG]; with 1.38 %, $d_4^0 = 1.0131$; $d_4^{5.1} = 1.0128$; $d_4^{6.9} = 0.9923$; $d_4^{9.9} = 0.9734$ (206)

La(NO₃)₃ [JAB] (291) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0076	10	1.0945	20	1.2052	30	1.3360
2	1.0167	12	1.1153	22	1.2295	32	1.3653
4	1.0353	14	1.1368	24	1.2547		
6	1.0545	16	1.1589	26	1.2809		
8	1.0742	18	1.1817	28	1.3080		

Ce₂(SO₄)₃ [JAB] (67) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0090	8	1.0823	16	1.1770	24	1.2876
2	1.0190	10	1.1047	18	1.2030		
4	1.0395	12	1.1279	20	1.2300		
6	1.0606	14	1.1520	22	1.2582		

Sa(NO₃)₃ [JAB] (291) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0061	8	1.0604	16	1.1271	24	1.2005
2	1.0136	10	1.0766	18	1.1447	26	1.2201
4	1.0289	12	1.0931	20	1.1628	28	1.2403
6	1.0445	14	1.1099	22	1.1814		

BeCl₂ [GS] (291); (84)***

%†	2	4	6	8	10	12
d_4^{18}	1.0118	1.0251	1.0386	1.0523	1.0663	1.0806

† With 14 %, $d_4^{18} = 1.0952$.**Be(ClO₃)₂ [GS] (602)**

%	1	2	3
d_4^{15}	1.00527	1.01141	1.01754

BeSO₄ [GS] (629)

%	1	2	3	4	5†
d_4^{25}	1.0058	1.0147	1.0237	1.0327	1.0417

† $d_4^{20} = 1.0870$ with 10 %; = 1.1769 with 20 % (312).**Be(NO₃)₂ [GS] (291)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0108	10	1.0624	18	1.1193	26	1.1819
4	1.0233	12	1.0761	20	1.1344	28	1.1985
6	1.0361	14	1.0902	22	1.1499		
8	1.0491	16	1.1046	24	1.1657		

MgCl₂ [GS] (20, 70, 366); (221, 342, 608, 611)*; (18, 49, 105, 106, 150, 173, 177, 219, 250, 261, 278, 322, 347, 417.5, 462, 464, 466, 469, 505, 533, 539, 618, 629)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0168	1.0163	1.0146	1.0134	1.0119	1.0084
4	1.0338	1.0330	1.0311	1.0298	1.0282	1.0248
6	1.0510	1.0499	1.0478	1.0463	1.0447	1.0413
8	1.0683	1.0669	1.0646	1.0631	1.0615	1.0580
10	1.0858	1.0840	1.0816	1.0801	1.0785	1.0749
12	1.1035	1.1014	1.0989	1.0974	1.0957	1.0921
14	1.1214	1.1190	1.1164	1.1149	1.1132	1.1095
16	1.1395	1.1369	1.1342	1.1326	1.1309	1.1272
18	1.1578	1.1551	1.1523	1.1506	1.1489	1.1452

MgCl₂—(Continued)

%	0°C	10°C	20°C	25°C	30°C	40°C
20	1.1764	1.1735	1.1706	1.1689	1.1672	1.1635
25	1.2246	1.2216	1.2184	1.2167	1.2149	1.2111
30	1.2754	1.2722	1.2688	1.2671	1.2652	1.2614

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0043	0.9995	0.9942	0.9883	0.9820	0.9753
4	1.0207	1.0159	1.0107	1.0050	0.9988	0.9923
6	1.0372	1.0325	1.0274	1.0218	1.0158	1.0095
8	1.0539	1.0493	1.0442	1.0388	1.0330	1.0269
10	1.0708	1.0663	1.0613	1.0560	1.0504	1.0444
12	1.0880	1.0836	1.0787	1.0735	1.0680	1.0622
14	1.1055	1.1011	1.0963	1.0912	1.0859	1.0803
16	1.1232	1.1188	1.1141	1.1092	1.1041	1.0984
18	1.1412	1.1368	1.1322	1.1275	1.1225	1.1170
20	1.1595	1.1552	1.1506	1.1460	1.1412	1.1359
25	1.2072	1.2031	1.1987	1.1942	1.1896	1.1847
30	1.2575	1.2535	1.2493	1.2451	1.2406	1.2360

%	10	12	14	16	%	35
d_4^{15}	1.0865	1.1044	1.1225	1.1408	d_4^{20}	1.3220

Mg(ClO₃)₂ [GS] (288, 602)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0135	10	1.0758	18	1.1442	26	1.2196
4	1.0287	12	1.0922	20	1.1624	28	1.2395
6	1.0441	14	1.1091	22	1.1810	30	1.2598
8	1.0597	16	1.1264	24	1.2001		

MgBr₂ [GS] (287, 367); (76, 318, 322, 366, 442)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0171	1.0167	1.0151	1.0139	1.0124	1.0089
4	1.0347	1.0341	1.0324	1.0311	1.0296	1.0260
6	1.0527	1.0519	1.0501	1.0487	1.0472	1.0435
8	1.0713	1.0702	1.0683	1.0668	1.0653	1.0615
10	1.0904	1.0891	1.0871	1.0855	1.0839	1.0800
12	1.1101	1.1087	1.1065	1.1049	1.1032	1.0992
14	1.1305	1.1289	1.1265	1.1248	1.1231	1.1191
16	1.1516	1.1497	1.1471	1.1455	1.1437	1.1395
18	1.1733	1.1711	1.1683	1.1666	1.1648	1.1605
20	1.1957	1.1933	1.1903	1.1885	1.1866	1.1823
25	1.2547	1.2517	1.2482	1.2462	1.2441	1.2396
30	1.3186	1.3150	1.3110	1.3089	1.3067	1.3020
35	1.388	1.383	1.379	1.377	1.374	1.370
40	1.462	1.457	1.452	1.450	1.448	1.443
45	1.541	1.537	1.532	1.529	1.527	1.522

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0047	0.9998	0.9944	0.9884	0.9819	0.9750
4	1.0218	1.0168	1.0114	1.0053	0.9988	0.9920
6	1.0393	1.0342	1.0288	1.0227	1.0161	1.0094
8	1.0572	1.0521	1.0466	1.0405	1.0340	1.0274
10	1.0756	1.0706	1.0650	1.0590	1.0525	1.0459
12	1.0946	1.0897	1.0841	1.0780	1.0716	1.0650
14	1.1143	1.1094	1.1038	1.0977	1.0913	1.0848
16	1.1347	1.1297	1.1242	1.1181	1.1117	1.1052
18	1.1557	1.1507	1.1452	1.1391	1.1327	1.1263
20	1.1775	1.1724	1.1669	1.1608	1.1544	1.1481
25	1.2347	1.2296	1.2241	1.2182	1.2119	1.2057
30	1.2970	1.2918	1.2863	1.2805	1.2743	1.2682
35	1.364	1.359	1.354	1.348	1.342	1.336
40	1.438	1.432	1.427	1.421	1.415	1.409
45	1.516	1.511	1.505	1.500	1.494	1.488

Mg(BrO₃)₂ [GS] (291)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0157	10	1.0871	18	1.1690	26	1.2617
4	1.0328	12	1.1066	20	1.1911	28	1.2869
6	1.0502	14	1.1268	22	1.2140	30	1.3134
8	1.0683	16	1.1476	24	1.2375		

MgI₂ [GS] (287, 368); (365)*; (442)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0169	1.0165	1.0149	1.0137	1.0122	1.0086
4	1.0345	1.0339	1.0321	1.0307	1.0292	1.0255
6	1.0526	1.0518	1.0498	1.0483	1.0467	1.0429
8	1.0713	1.0702	1.0680	1.0665	1.0648	1.0609
10	1.0907	1.0893	1.0869	1.0854	1.0836	1.0796
12	1.1107	1.1091	1.1065	1.1049	1.1030	1.0989
14	1.1314	1.1295	1.1268	1.1251	1.1231	1.1189
16	1.1529	1.1507	1.1478	1.1460	1.1440	1.1395
18	1.1751	1.1727	1.1695	1.1676	1.1656	1.1609
20	1.1981	1.1953	1.1920	1.1900	1.1879	1.1830
25	1.2591	1.2557	1.2519	1.2497	1.2473	1.2421
30	1.3265	1.3223	1.3180	1.3156	1.3131	1.3074
35	1.4012	1.3962	1.3914	1.3887	1.3861	1.3799
40	1.4839	1.4784	1.4730	1.4702	1.4672	1.4607

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0043	0.9994	0.9940	0.9879	0.9814	0.9745
4	1.0212	1.0161	1.0107	1.0045	0.9980	0.9910
6	1.0385	1.0333	1.0279	1.0217	1.0151	1.0080
8	1.0564	1.0511	1.0456	1.0394	1.0328	1.0257
10	1.0749	1.0696	1.0640	1.0578	1.0511	1.0441
12	1.0941	1.0888	1.0830	1.0768	1.0701	1.0631
14	1.1140	1.1086	1.1027	1.0965	1.0897	1.0827
16	1.1346	1.1291	1.1231	1.1169	1.1100	1.1029
18	1.1559	1.1503	1.1442	1.1379	1.1311	1.1239
20	1.1779	1.1722	1.1661	1.1597	1.1529	1.1457
25	1.2367	1.2307	1.2244	1.2178	1.2108	1.2037
30	1.3017	1.2954	1.2889	1.2821	1.2750	1.2679
35	1.3738	1.3673	1.3606	1.3536	1.3464	1.3392
40	1.4542	1.4475	1.4406	1.4334	1.4260	1.4186

MgSO₄ [GS] (219, 221, 342, 346, 374, 375); (505)*; (7, 8, 18, 20, 46, 49, 105, 106, 150, 192, 204, 250, 278, 298, 318, 329, 336, 344, 348, 349, 401, 402, 403, 404, 425, 449, 469, 506, 533, 534, 550, 573, 618, 629)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0210	1.0204	1.0186	1.0173	1.0158	1.0123
4	1.0423	1.0413	1.0392	1.0378	1.0362	1.0326
6	1.0639	1.0625	1.0602	1.0587	1.0570	1.0532
8	1.0858	1.0841	1.0816	1.0800	1.0782	1.0743
10	1.1081	1.1061	1.1034	1.1017	1.0999	1.0958
12	1.1309	1.1286	1.1256	1.1239	1.1220	1.1179
14	1.1541	1.1516	1.1484	1.1466	1.1447	1.1405
16	1.1777	1.1750	1.1717	1.1698	1.1679	1.1637
18	1.2018	1.1989	1.1955	1.1936	1.1916	1.1874
20	1.2264	1.2233	1.2198	1.2179	1.2159	1.2117
22	1.2515	1.2483	1.2447	1.2428	1.2408	1.2365
24	1.2771	1.2738	1.2701	1.2682	1.2662	1.2619
26	1.3032	1.2998	1.2961	1.2942	1.2922	1.2879

%	50°C	60°C	70°C	80°C	%	50°C
2	1.0081	1.0032	0.9978	0.9916	16	1.1592
4	1.0283	1.0234	1.0180	1.0118	18	1.1829
6	1.0489	1.0440	1.0386	1.0324	20	1.2072
8	1.0700	1.0650	1.0596	1.0534	22	1.2321
10	1.0915	1.0864	1.0810	1.0748	24	1.2576
12	1.1135	1.1083	1.1029	1.0968	26	1.2836
14	1.1361	1.1308	1.1253	1.1193		

MgSO₄—(Continued)

%	$d_4^{6.29}$ (346)	$d_4^{20.004}$ (373)	%	$d_4^{6.29}$ (346)
0.00	0.999 9585	0.998 23150†	0.07	1.000 7042
0.01	1.000 0659	0.998 33872	0.08	1.000 8100
0.02	1.000 1728	0.998 44553	0.09	1.000 9157
0.03	1.000 2794	0.998 55198	0.1	1.001 0213
0.04	1.000 3858	0.998 65812	0.2	1.002 0733
0.05	1.000 4921	0.998 76403	0.3	1.003 1199
0.06	1.000 5982	0.998 86973	0.4	1.004 1645

† The small figures are significant only for ratios within the table.

Mg(NO₃)₂ [GS] (110, 287, 342); (606, 609)*; (20, 106, 150, 278, 322, 462, 464, 466, 469, 533, 535, 618, 628, 629)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0157	1.0151	1.0132	1.0119	1.0104	1.0068
4	1.0318	1.0307	1.0285	1.0271	1.0254	1.0216
6	1.0482	1.0466	1.0441	1.0426	1.0408	1.0367
8	1.0649	1.0629	1.0600	1.0584	1.0565	1.0522
10	1.0819	1.0795	1.0762	1.0745	1.0725	1.0681
12	1.0992	1.0964	1.0928	1.0910	1.0889	1.0843
14	1.1168	1.1137	1.1098	1.1079	1.1057	1.1009
16		1.1314	1.1272	1.1251	1.1229	
18		1.1494	1.1449	1.1427	1.1404	
20		1.1677	1.1630	1.1607	1.1582	
22		1.1864	1.1815	1.1790	1.1764	
24		1.2055	1.2004	1.1977	1.1949	

Mg(CHO₂)₂, Formate [JAB] (291); (329)**

%	1	2	3	4	5
d_4^{18}	1.0060	1.0134	1.0209	1.0284	1.0360

Mg(C₂H₃O₂)₂, Acetate [JAB] (288); (561)**

%	1	2	4	6	8	10
d_4^{18}	1.0043	1.0101	1.0216	1.0331	1.0447	1.0564
%	12	14	16	18	20	22
d_4^{18}	1.0682	1.0802	1.0923	1.1045	1.1169	1.1295

MgCrO₄ [GS] (288); (566)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0185	10	1.1018	18	1.1946	26	1.2965
4	1.0387	12	1.1240	20	1.2194		
6	1.0592	14	1.1469	22	1.2446		
8	1.0802	16	1.1704	24	1.2703		

Ca(OH)₂ [GS] (98, 102, 529, 631)

%	d_4^{15}	d_4^{25}	%	d_4^{15}	d_4^{25}
0.05	0.99979	0.99773	0.15	1.00110	0.99904
0.10	1.00044	0.99838			

CaCl₂ [GS] (219, 221, 342, 367, 588); (68, 69, 84, 312, 363, 493, 606, 608, 609, 611)*; (18, 49, 50, 98, 105, 106, 139, 159, 173, 177, 189, 190, 192, 261, 318, 320, 321, 322, 347, 355, 401, 402, 407, 417.5, 506, 529, 533, 535, 550, 564, 573, 613, 618, 640)**

%	-5°C	0°C	+10°C	20°C	25°C	30°C
2		1.0171	1.0166	1.0148	1.0135	1.0120
4		1.0346	1.0337	1.0316	1.0302	1.0286
6		1.0523	1.0509	1.0486	1.0471	1.0455
8	1.0708	1.0703	1.0684	1.0659	1.0643	1.0626
10	1.0894	1.0886	1.0863	1.0835	1.0818	1.0800
12	1.1083	1.1072	1.1045	1.1015	1.0997	1.0978
14	1.1275	1.1261	1.1231	1.1198	1.1180	1.1160
16	1.1471	1.1454	1.1421	1.1386	1.1366	1.1345
18	1.1670	1.1651	1.1616	1.1578	1.1557	1.1535
20	1.1874	1.1853	1.1815	1.1775	1.1753	1.1730
25		1.2376	1.2330	1.2284	1.2260	1.2236
30		1.2922	1.2869	1.2816	1.2790	1.2764
35				1.3373	1.3345	1.3316
40				1.3957	1.3927	1.3895

CaCl₂—(Continued)

%	40°C	50°C	60°C	70°C	80°C	90°C
2	1.0084	1.0043	0.9994	0.9940	0.9881	0.9816
4	1.0249	1.0207	1.0158	1.0104	1.0046	0.9981
6	1.0416	1.0373	1.0324	1.0270	1.0213	1.0148
8	1.0586	1.0542	1.0492	1.0439	1.0382	1.0317
10	1.0760	1.0715	1.0664	1.0611	1.0554	1.0490
12	1.0937	1.0891	1.0840	1.0787	1.0730	1.0667
14	1.1117	1.1070	1.1019	1.0966	1.0909	1.0847
16	1.1301	1.1254	1.1202	1.1148	1.1092	1.1031
18	1.1490	1.1442	1.1389	1.1335	1.1279	1.1219
20	1.1684	1.1635	1.1581	1.1528	1.1471	1.1412
25	1.2186	1.2134	1.2079	1.2024	1.1965	1.1906
30	1.2709	1.2654	1.2597	1.2539	1.2478	1.2419
35	1.3255	1.3196	1.3137	1.3075	1.3013	1.2953
40	1.3826	1.3762	1.3700	1.3635	1.3571	1.3510

%	100°C†	110°C	120°C	130°C	140°C
2	0.9748	0.9674	0.9596	0.9514	0.9428
4	0.9915	0.9842	0.9765	0.9685	0.9601
6	1.0085	1.0012	0.9937	0.9859	0.9776
8	1.0257	1.0185	1.0111	1.0035	0.9954
10	1.0432	1.0361	1.0287	1.0213	1.0134
12	1.0610	1.0539	1.0466	1.0394	1.0317
14	1.0790	1.0720	1.0649	1.0577	1.0503
16	1.0973	1.0905	1.0835	1.0763	1.0691
18	1.1160	1.1094	1.1025	1.0954	1.0883
20	1.1352	1.1287	1.1219	1.1150	1.1080
25	1.1846				
30	1.2359				
35	1.2893				
40	1.3450				

† Values over 100°C corrected to one atmosphere pressure.

CaOCl₂, Bleaching powder [GS] (389)**[CaOCl₂, 89.51 %; CaCl₂, 7.31 %; Ca(ClO₃)₂, 0.26 %; Ca(OH)₂, 2.92 %]**

% total salt . . .	2	4	6	8	10	12
d_4^{15}	1.0169	1.0345	1.0520	1.0697	1.0876	1.1060

Ca(ClO₃)₂ [GS] (288); (602)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0135	10	1.0768	18	1.1469	26	1.2247
4	1.0288	12	1.0936	20	1.1656	28	1.2454
6	1.0444	14	1.1109	22	1.1848	30	1.2665
8	1.0604	16	1.1286	24	1.2045		

CaBr₂ [GS] (287, 368); (312, 363)*; (139, 318, 322, 618)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0173	1.0169	1.0152	1.0139	1.0125	1.0089
4	1.0352	1.0345	1.0326	1.0312	1.0296	1.0260
6	1.0535	1.0525	1.0504	1.0489	1.0473	1.0435
8	1.0724	1.0711	1.0688	1.0672	1.0655	1.0616
10	1.0919	1.0903	1.0877	1.0860	1.0843	1.0802
12	1.1119	1.1099	1.1071	1.1054	1.1035	1.0994
14	1.1325	1.1302	1.1272	1.1254	1.1234	1.1192
16	1.1538	1.1512	1.1480	1.1461	1.1441	1.1396
18	1.1759	1.1730	1.1696	1.1676	1.1655	1.1608
20	1.1988	1.1955	1.1919	1.1897	1.1876	1.1827
25	1.2584	1.2542	1.2499	1.2475	1.2451	1.2397
30	1.3226	1.3175	1.3125	1.3099	1.3072	1.3014
35	1.393	1.387	1.381	1.378	1.375	1.369
40	1.469	1.463	1.457	1.453	1.450	1.443
45	1.555	1.548	1.541	1.537	1.534	1.526
50	1.650	1.642	1.635	1.631	1.627	1.619

CaBr₂—(Continued)

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0047	0.9988	0.9943	0.9883	0.9817	0.9748
4	1.0217	1.0168	1.0112	1.0052	0.9985	0.9917
6	1.0391	1.0342	1.0285	1.0225	1.0158	1.0090
8	1.0570	1.0521	1.0464	1.0403	1.0337	1.0269
10	1.0756	1.0705	1.0648	1.0587	1.0520	1.0452
12	1.0947	1.0894	1.0837	1.0775	1.0708	1.0641
14	1.1143	1.1090	1.1032	1.0970	1.0903	1.0836
16	1.1346	1.1293	1.1234	1.1172	1.1105	1.1038
18	1.1557	1.1503	1.1443	1.1381	1.1314	1.1247
20	1.1775	1.1720	1.1660	1.1598	1.1530	1.1463
25	1.2343	1.2285	1.2224	1.2160	1.2092	1.2024
30	1.2957	1.2896	1.2833	1.2768	1.2698	1.2630
35	1.363	1.356	1.350	1.343	1.336	1.329
40	1.437	1.430	1.423	1.416	1.409	1.402
45	1.519	1.512	1.505	1.498	1.490	1.483
50	1.612	1.604	1.597	1.589	1.582	1.574

CaI₂ [GS] (287, 369); (322, 365, 618)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0171	1.0166	1.0150	1.0138	1.0123	1.0087
4	1.0348	1.0341	1.0323	1.0309	1.0293	1.0256
6	1.0530	1.0521	1.0500	1.0485	1.0468	1.0430
8	1.0718	1.0706	1.0683	1.0668	1.0650	1.0610
10	1.0913	1.0897	1.0873	1.0857	1.0838	1.0796
12	1.1115	1.1096	1.1069	1.1053	1.1033	1.0989
14	1.1325	1.1303	1.1273	1.1256	1.1236	1.1190
16	1.1542	1.1517	1.1485	1.1466	1.1446	1.1398
18	1.1765	1.1737	1.1703	1.1683	1.1662	1.1613
20	1.1996	1.1965	1.1928	1.1906	1.1884	1.1834
25	1.2612	1.2573	1.2530	1.2506	1.2482	1.2427
30	1.3292	1.3244	1.3195	1.3168	1.3141	1.3081
35	1.4040	1.3984	1.3928	1.3897	1.3867	1.3802
40	1.4862	1.4798	1.4734	1.4700	1.4666	1.4596

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0045	0.9995	0.9940	0.9879	0.9814	0.9745
4	1.0213	1.0162	1.0107	1.0045	0.9979	0.9910
6	1.0385	1.0333	1.0278	1.0216	1.0148	1.0079
8	1.0563	1.0510	1.0454	1.0392	1.0323	1.0253
10	1.0748	1.0695	1.0637	1.0574	1.0505	1.0434
12	1.0940	1.0886	1.0827	1.0763	1.0694	1.0622
14	1.1140	1.1085	1.1025	1.0960	1.0889	1.0818
16	1.1347	1.1290	1.1229	1.1163	1.1091	1.1020
18	1.1560	1.1502	1.1440	1.1373	1.1300	1.1228
20	1.1778	1.1719	1.1656	1.1589	1.1516	1.1443
25	1.2367	1.2304	1.2238	1.2168	1.2093	1.2018
30	1.3016	1.2950	1.2880	1.2808	1.2730	1.2653
35	1.3732	1.3662	1.3588	1.3513	1.3431	1.3352
40	1.4521	1.4445	1.4368	1.4288	1.4204	1.4123

CaSO₄ [GS]; d_4^{25} = 0.99756 with 0.05 %; = 0.99805 with 0.10 % (98)**Ca(HS)₂ [GS] (154)**

%	d_4^{23}	%	$d_4^{23.5}$
32	1.255	37.5	1.310

Ca(NO₃)₂ [GS] (110); (137, 342, 606, 628)*; (189, 190, 192, 208, 222, 223, 261, 322, 329, 378, 407, 529, 618, 629)**

%	6°C	18°C	25°C	30°C	%	18°C
2	1.0157	1.0137	1.0120	1.0105	30	1.260
4	1.0316	1.0291	1.0272	1.0256	35	1.311
6	1.0477	1.0448	1.0427	1.0409	40	1.365
8	1.0641	1.0608	1.0585	1.0565	45	1.422
10	1.0808	1.0771	1.0746	1.0724		
12	1.0979	1.0937	1.0911	1.0887		

Ca(NO₃)₂—(Continued)

%	6°C	18°C	25°C	30°C	%	18°C
14	1.1153	1.1106	1.1079	1.1055		
16	1.1330	1.1279	1.1250	1.1224		
18	1.1510	1.1455	1.1424	1.1397		
20	1.1694	1.1636	1.1602	1.1575		
25	1.2168	1.2106	1.2065	1.2032		
68†		1.747	1.741	1.736		

† Supercooled tetrahydrate (M.P., 41.4°C).

CaH₄(PO₄)₂ [GS]; with 2.506 %, $d_4^{19} = 1.0171$ (76)Ca(CHO₂)₂, Formate [JAB] (291)**; (329)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0056	4	1.0268	8	1.0560	12	1.0858
2	1.0126	6	1.0413	10	1.0708		

Ca(C₂H₃O₂)₂, Acetate [JAB] (288)**; (208, 224, 529)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0043	6	1.0331	12	1.0679	18	1.1029
2	1.0100	8	1.0447	14	1.0795	20	1.1146
4	1.0215	10	1.0563	16	1.0912	22	1.1263

Ca(C₃H₅O₂)₂, Propionate [JAB] (291)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0035	8	1.0376	16	1.0766	24	1.1157
2	1.0084	10	1.0474	18	1.0864	26	1.1254
4	1.0181	12	1.0571	20	1.0962		
6	1.0279	14	1.0669	22	1.1059		

Ca(CNS)₂ [GS]; with 33.79 %, $d_4^{17} = 1.2182$ (155)Ca₂Fe(CN)₆ [GS] (41, 42)

%	d_4^9	%	d_4^9	%	d_4^9	%	d_4^9
2	1.01687	10	1.08781	18	1.16374	26	1.24459
4	1.03416	12	1.10630	20	1.18353	28	1.26546
6	1.05175	14	1.12513	22	1.20362	30	1.28659
8	1.06963	16	1.14428	24	1.22398	32	1.30798

CaCrO₄ [GS] (250)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0083	3	1.0278	5	1.0477	7	1.0680
2	1.0180	4	1.0377	6	1.0578		

Sr(OH)₂ [GS] (100)**; (529)

%	15°C	20°C	25°C	30°C
0.1	1.00043	0.99948	0.99827	0.99681
0.2	1.00179	1.00081	0.99957	0.99811
0.3	1.00321	1.00225	1.00100	0.99954

SrCl₂ [GS] (221, 342, 347, 367, 548)**; (18, 105, 106, 189, 190, 192, 261, 278, 312, 363, 378, 407, 417.5, 451, 529, 573, 618, 627, 629)

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0183	1.0178	1.0161	1.0149	1.0134	1.0097
4	1.0372	1.0364	1.0344	1.0331	1.0315	1.0277
6	1.0567	1.0554	1.0532	1.0518	1.0501	1.0462
8	1.0767	1.0750	1.0726	1.0711	1.0693	1.0653
10	1.0973	1.0952	1.0925	1.0909	1.0891	1.0849
12	1.1185	1.1160	1.1130	1.1113	1.1094	1.1051
14	1.1402	1.1374	1.1341	1.1323	1.1303	1.1259
16	1.1625	1.1593	1.1558	1.1539	1.1518	1.1472
18	1.1853	1.1819	1.1781	1.1761	1.1739	1.1691
20	1.2088	1.2051	1.2010	1.1990	1.1966	1.1917
25	1.269	1.265	1.260	1.258	1.255	1.250
30			1.325	1.322	1.319	1.314
35			1.396	1.393	1.390	1.384

SrCl₂—(Continued)

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0055	1.0005	0.9951	0.9891	0.9826	0.9758
4	1.0233	1.0183	1.0129	1.0069	1.0004	0.9936
6	1.0417	1.0366	1.0312	1.0252	1.0187	1.0119
8	1.0607	1.0555	1.0500	1.0440	1.0375	1.0307
10	1.0802	1.0750	1.0694	1.0634	1.0569	1.0502
12	1.1003	1.0950	1.0894	1.0834	1.0768	1.0702
14	1.1209	1.1156	1.1100	1.1039	1.0973	1.0907
16	1.1422	1.1368	1.1311	1.1250	1.1184	1.1118
18	1.1641	1.1586	1.1528	1.1467	1.1401	1.1335
20	1.1866	1.1810	1.1752	1.1690	1.1625	1.1559
25	1.245	1.239	1.233	1.227	1.220	1.213
30	1.308	1.302	1.296	1.289	1.282	1.276
35	1.378	1.372	1.365	1.358	1.351	1.345

Sr(ClO₃)₂ [GS] (288)**; (602)*

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0147	10	1.0825	18	1.1593	35	1.3563
4	1.0310	12	1.1010	20	1.1800		
6	1.0476	14	1.1203	25	1.2348		
8	1.0647	16	1.1394	30	1.2935		

SrBr₂ [GS] (287, 367)**; (363)*; (18, 189, 190, 312, 318, 320, 322)

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0178	1.0174	1.0157	1.0145	1.0130	1.0093
4	1.0363	1.0356	1.0337	1.0324	1.0308	1.0270
6	1.0553	1.0543	1.0522	1.0508	1.0492	1.0452
8	1.0748	1.0735	1.0712	1.0697	1.0680	1.0639
10	1.0949	1.0932	1.0907	1.0891	1.0873	1.0831
12	1.1156	1.1136	1.1109	1.1092	1.1072	1.1029
14	1.1369	1.1346	1.1317	1.1299	1.1279	1.1234
16	1.1591	1.1564	1.1532	1.1513	1.1493	1.1447
18	1.1821	1.1791	1.1757	1.1738	1.1716	1.1668
20	1.2060	1.2029	1.1992	1.1971	1.1949	1.1899
25	1.270	1.266	1.262	1.259	1.257	1.251
30	1.339	1.335	1.330	1.327	1.324	1.318
35	1.416	1.411	1.405	1.402	1.398	1.392
40	1.501	1.495	1.489	1.486	1.482	1.475
45	1.597	1.590	1.583	1.579	1.575	1.568
50			1.686			

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0051	1.0002	0.9947	0.9887	0.9821	0.9752
4	1.0227	1.0177	1.0121	1.0060	0.9994	0.9925
6	1.0408	1.0357	1.0301	1.0238	1.0172	1.0103
8	1.0594	1.0541	1.0485	1.0422	1.0357	1.0286
10	1.0785	1.0731	1.0675	1.0611	1.0545	1.0473
12	1.0982	1.0927	1.0870	1.0805	1.0738	1.0667
14	1.1186	1.1130	1.1071	1.1006	1.0938	1.0868
16	1.1397	1.1340	1.1281	1.1215	1.1147	1.1077
18	1.1616	1.1559	1.1499	1.1433	1.1364	1.1293
20	1.1846	1.1788	1.1727	1.1661	1.1591	1.1519
25	1.246	1.240	1.233	1.227	1.219	1.212
30	1.312	1.306	1.299	1.293	1.285	1.278
35	1.386	1.379	1.372	1.365	1.358	1.350
40	1.468	1.461	1.454	1.446	1.439	1.431
45	1.561	1.553	1.545	1.538	1.530	1.522

Sr(BrO₃)₂ [GS] (291)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0157	8	1.0700	14	1.1297	20	1.1948
4	1.0332	10	1.0893	16	1.1508	22	1.2177
6	1.0513	12	1.1092	18	1.1725		

SrI₂ [GS] (287, 369); (365)*; (322)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0175	1.0171	1.0154	1.0142	1.0127	1.0090
4	1.0357	1.0350	1.0331	1.0318	1.0302	1.0265
6	1.0544	1.0535	1.0513	1.0499	1.0482	1.0444
8	1.0738	1.0726	1.0701	1.0686	1.0669	1.0629
10	1.0938	1.0923	1.0896	1.0880	1.0862	1.0821
12	1.1146	1.1128	1.1099	1.1082	1.1062	1.1020
14	1.1361	1.1339	1.1308	1.1290	1.1270	1.1225
16	1.1584	1.1559	1.1526	1.1506	1.1486	1.1439
18	1.1817	1.1789	1.1753	1.1732	1.1711	1.1662
20	1.2060	1.2028	1.1990	1.1967	1.1944	1.1894
25	1.2693	1.2654	1.2608	1.2583	1.2558	1.2502
30	1.3395	1.3347	1.3295	1.3267	1.3238	1.3176
35	1.4173	1.4116	1.4058	1.4026	1.3994	1.3924
40	1.5036	1.4970	1.4904	1.4869	1.4834	1.4757
45	1.5991	1.5917	1.5844	1.5804	1.5766	1.5684

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0048	0.9999	0.9944	0.9882	0.9817	0.9748
4	1.0220	1.0170	1.0114	1.0052	0.9986	0.9916
6	1.0398	1.0346	1.0289	1.0227	1.0160	1.0090
8	1.0582	1.0529	1.0471	1.0408	1.0340	1.0269
10	1.0773	1.0718	1.0659	1.0595	1.0526	1.0455
12	1.0970	1.0914	1.0853	1.0789	1.0719	1.0648
14	1.1174	1.1117	1.1055	1.0990	1.0918	1.0847
16	1.1386	1.1328	1.1265	1.1198	1.1126	1.1054
18	1.1607	1.1547	1.1483	1.1415	1.1342	1.1270
20	1.1837	1.1775	1.1711	1.1642	1.1568	1.1495
25	1.2440	1.2376	1.2309	1.2235	1.2161	1.2084
30	1.3110	1.3042	1.2970	1.2893	1.2815	1.2737
35	1.3855	1.3781	1.3705	1.3625	1.3544	1.3463
40	1.4683	1.4605	1.4521	1.4441	1.4356	1.4272
45	1.5603	1.5523	1.5436	1.5348	1.5259	1.5172

Sr(NO₃)₂ [GS] (375); (192, 224, 361, 384, 629)*; (84, 189, 190, 261, 318, 329, 360, 378, 407, 451, 529, 605, 618, 628)**

%	0°C	10°C	20°C†	30°C	40°C	50°C
2	1.017	1.016	1.015	1.012	1.008	1.004
4	1.034	1.033	1.031	1.028	1.024	1.020
6	1.052	1.050	1.048	1.045	1.041	1.036
8	1.070	1.068	1.065	1.062	1.058	1.052
10	1.088	1.086	1.083	1.079	1.074	1.069
12	1.107	1.104	1.101	1.097	1.092	1.086
14	1.126	1.123	1.119	1.115	1.110	1.104
16	1.146	1.142	1.138	1.134	1.129	1.123
18	1.166	1.163	1.158	1.154	1.148	1.142
20	1.187	1.184	1.179	1.174	1.168	1.162
25	1.245	1.239	1.233	1.227	1.221	1.215

%	60°C	70°C	80°C	%	60°C	70°C	80°C
2	0.999	0.993	0.987	14	1.098	1.092	1.086
4	1.015	1.009	1.003	16	1.117	1.111	1.104
6	1.031	1.025	1.019	18	1.136	1.129	1.123
8	1.047	1.041	1.035	20	1.156	1.149	1.142
10	1.064	1.057	1.051	25	1.208	1.201	1.194
12	1.081	1.074	1.068				

† $d_4^{20} = 1.290$ with 30 %; = 1.352 with 35 %; = 1.419 with 40 %.**Sr(CHO₂)₂, Formate [JAB] (288)**; (329)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0067	4	1.0312	8	1.0647	12	1.0998
2	1.0148	6	1.0478	10	1.0820		

Sr(C₂H₃O₂)₂, Acetate [JAB] (288); (529, 561)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0054	8	1.0543	16	1.1138	24	1.1770
2	1.0122	10	1.0688	18	1.1293		
4	1.0260	12	1.0836	20	1.1450		
6	1.0400	14	1.0986	22	1.1609		

Sr₂Fe(CN)₆ [GS] (42)

%	d_4^0	%	d_4^0	%	d_4^0	%	d_4^0
2	1.0175	8	1.0738	14	1.1342	20	1.1996
4	1.0357	10	1.0935	16	1.1554		
6	1.0546	12	1.1136	18	1.1772		

Ba(OH)₂ [GS] (342, 472); (529)*; (100, 252); $d_4^{20} = 1.0193$ with 2 %; = 1.0420 with 4 %****BaCl₂ [GS] (364)**; (36, 38, 106, 110, 219, 221, 312, 342, 347, 608, 611)*; (49, 105, 128, 139, 189, 199, 261, 278, 313, 344, 363, 378, 411, 417.5, 425, 451, 529, 533, 534, 535, 573, 618, 629)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0181	1.0176	1.0159	1.0147	1.0132	1.0096
4	1.0368	1.0360	1.0341	1.0328	1.0312	1.0275
6	1.0561	1.0550	1.0528	1.0514	1.0497	1.0459
8	1.0760	1.0746	1.0721	1.0706	1.0688	1.0648
10	1.0965	1.0948	1.0921	1.0905	1.0885	1.0844
12	1.1178	1.1157	1.1128	1.1111	1.1090	1.1047
14	1.1399	1.1374	1.1342	1.1325	1.1303	1.1259
16	1.1627	1.1599	1.1564	1.1546	1.1524	1.1478
18	1.1862	1.1831	1.1793	1.1774	1.1752	1.1704
20	1.2105	1.2071	1.2031	1.2010	1.1987	1.1938
22		1.2319	1.2277	1.2255	1.2230	1.2180
24		1.2575	1.2531	1.2508	1.2482	1.2430
26		1.2839	1.2793	1.2769	1.2742	1.2688

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0054	1.0004	0.9950	0.9890	0.9824	0.9755
4	1.0232	1.0181	1.0126	1.0066	1.0000	0.9931
6	1.0415	1.0363	1.0307	1.0247	1.0181	1.0112
8	1.0603	1.0551	1.0495	1.0434	1.0368	1.0299
10	1.0798	1.0746	1.0689	1.0627	1.0561	1.0492
12	1.1001	1.0948	1.0890	1.0827	1.0761	1.0692
14	1.1211	1.1157	1.1098	1.1034	1.0968	1.0899
16	1.1428	1.1373	1.1313	1.1249	1.1182	1.1113
18	1.1653	1.1596	1.1536	1.1472	1.1404	1.1334
20	1.1885	1.1828	1.1767	1.1702	1.1634	1.1563
22	1.2125	1.2068	1.2006	1.1940	1.1872	1.1800
24	1.2374	1.2316	1.2253	1.2186	1.2117	1.2045
26	1.2631	1.2571	1.2507	1.2440	1.2370	1.2298

Ba(ClO₃)₂ [GS] (110, 288)**

%	d_4^6	d_4^{18}	d_4^{30}	%	d_4^6	d_4^{18}	d_4^{30}
2	1.0166	1.0148	1.0117	14	1.1263	1.1224	1.1177
4	1.0335	1.0314	1.0280	16	1.1466	1.1424	1.1374
6	1.0509	1.0485	1.0449	18	1.1675	1.1631	1.1577
8	1.0688	1.0661	1.0622	20	1.1891	1.1843	1.1787
10	1.0874	1.0843	1.0801	22	1.2114	1.2062	1.2004
12	1.1065	1.1031	1.0986	24	1.2343	1.2287	1.2227

BaBr₂ [GS] (287, 367); (18, 190, 307, 312, 318, 322, 361, 378)**

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0176	1.0172	1.0156	1.0143	1.0129	1.0093
4	1.0360	1.0353	1.0335	1.0321	1.0306	1.0269
6	1.0549	1.0540	1.0519	1.0505	1.0489	1.0450
8	1.0745	1.0733	1.0710	1.0695	1.0678	1.0638
10	1.0948	1.0933	1.0907	1.0892	1.0874	1.0833
12	1.1158	1.1139	1.1111	1.1096	1.1076	1.1034
14	1.1375	1.1353	1.1323	1.1306	1.1286	1.1242
16	1.1599	1.1575	1.1543	1.1524	1.1504	1.1458

BaBr₂.—(Continued)

%	0°C	10°C	20°C	25°C	30°C	40°C
18	1.1831	1.1805	1.1770	1.1750	1.1729	1.1681
20	1.2072	1.2043	1.2006	1.1985	1.1963	1.1913
25	1.2714	1.2677	1.2634	1.2610	1.2585	1.2531
30	1.3421	1.3375	1.3325	1.3299	1.3270	1.3212
35	1.4197	1.4143	1.4087	1.4057	1.4025	1.3961
40	1.5052	1.4989	1.4926	1.4893	1.4858	1.4789

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0050	1.0001	0.9946	0.9885	0.9820	0.9750
4	1.0224	1.0175	1.0119	1.0059	0.9992	0.9921
6	1.0404	1.0354	1.0297	1.0236	1.0169	1.0098
8	1.0591	1.0540	1.0482	1.0420	1.0353	1.0282
10	1.0785	1.0733	1.0674	1.0611	1.0543	1.0472
12	1.0985	1.0931	1.0872	1.0809	1.0739	1.0668
14	1.1192	1.1137	1.1077	1.1013	1.0942	1.0871
16	1.1407	1.1351	1.1290	1.1225	1.1153	1.1082
18	1.1629	1.1572	1.1510	1.1444	1.1372	1.1300
20	1.1860	1.1801	1.1739	1.1672	1.1599	1.1526
25	1.2474	1.2413	1.2347	1.2278	1.2203	1.2129
30	1.3150	1.3086	1.3016	1.2945	1.2869	1.2792
35	1.3895	1.3826	1.3754	1.3679	1.3601	1.3522
40	1.4717	1.4643	1.4568	1.4489	1.4407	1.4327

BaI₂ [GS] (287, 369)**; (365)*; (76, 322)

%	0°C	10°C	20°C	25°C	30°C	40°C
2	1.0174	1.0171	1.0154	1.0142	1.0127	1.0091
4	1.0356	1.0350	1.0331	1.0318	1.0302	1.0265
6	1.0543	1.0534	1.0513	1.0499	1.0482	1.0443
8	1.0735	1.0724	1.0701	1.0686	1.0668	1.0628
10	1.0934	1.0921	1.0896	1.0880	1.0861	1.0819
12	1.1141	1.1126	1.1099	1.1081	1.1062	1.1018
14	1.1356	1.1338	1.1308	1.1290	1.1271	1.1225
16	1.1580	1.1558	1.1525	1.1506	1.1486	1.1439
18	1.1811	1.1786	1.1750	1.1730	1.1709	1.1660
20	1.2050	1.2021	1.1984	1.1963	1.1939	1.1889
25	1.2692	1.2655	1.2610	1.2587	1.2560	1.2504
30	1.3386	1.3340	1.3289	1.3263	1.3232	1.3171
35	1.416	1.410	1.404	1.401	1.398	1.391
40	1.503	1.496	1.490	1.486	1.483	1.475
45	1.602	1.594	1.587	1.583	1.579	1.571
50	1.715	1.706	1.698	1.694	1.689	1.680
55	1.844	1.834	1.825	1.820	1.815	1.805
60			1.970	1.965	1.959	1.949

%	50°C	60°C	70°C	80°C	90°C	100°C
2	1.0048	0.9998	0.9943	0.9883	0.9817	0.9747
4	1.0220	1.0169	1.0114	1.0053	0.9986	0.9915
6	1.0398	1.0345	1.0289	1.0227	1.0159	1.0087
8	1.0581	1.0528	1.0470	1.0406	1.0338	1.0266
10	1.0771	1.0717	1.0658	1.0593	1.0524	1.0452
12	1.0968	1.0914	1.0853	1.0788	1.0717	1.0644
14	1.1173	1.1117	1.1055	1.0989	1.0918	1.0844
16	1.1385	1.1327	1.1264	1.1197	1.1125	1.1050
18	1.1605	1.1545	1.1481	1.1414	1.1340	1.1264
20	1.1832	1.1771	1.1706	1.1637	1.1563	1.1485
25	1.2444	1.2378	1.2309	1.2237	1.2161	1.2081
30	1.3105	1.3036	1.2964	1.2887	1.2808	1.2727
35	1.384	1.377	1.369	1.361	1.353	1.345
40	1.468	1.460	1.451	1.443	1.434	1.426
45	1.562	1.554	1.545	1.536	1.527	1.518
50	1.671	1.662	1.653	1.643	1.634	1.624
55	1.796	1.786	1.776	1.766	1.756	1.746
60	1.938	1.928	1.917	1.907	1.896	1.886

BaS₂O₃ [GS]; $d_4^{19} = 1.0157$ for 1.15%; = 1.1050 for 12.024% (76)
 Ba(NO₃)₂ [GS] (287)**; (342)*; (190, 224, 261, 329, 360, 361, 378, 411, 425, 451, 472, 529, 618, 628, 629)

%	2	4	6	8
d_4^{18}	1.0151	1.0320	1.0494	1.0674

% (84)	d_4^{15}	$d_4^{19.5}$	% (84)	$d_4^{19.5}$
0.2	1.00078	0.99999	1.0	1.00658
0.4	1.00244	1.00164	1.2	1.00823
0.6	1.00410	1.00329	1.4	1.00988
0.8	1.00575	1.00493	1.6	1.01153

Ba(CHO₂)₂, Formate [LJG] (291)**; (329) [JAB]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0069	6	1.0492	12	1.1039	18	1.1634
2	1.0152	8	1.0669	14	1.1233	20	1.1840
4	1.0320	10	1.0851	16	1.1431		

Ba(C₂H₃O₂)₂, Acetate [LJG] (288)**; (208, 224, 329, 529) [JAB]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0059	10	1.0745	20	1.1599	30	1.2554
2	1.0133	12	1.0908	22	1.1782	35	1.3069
4	1.0282	14	1.1075	24	1.1970	40	1.3608
6	1.0433	16	1.1246	26	1.2161		
8	1.0587	18	1.1421	28	1.2356		

Ba(C₃H₅O₂)₂, Propionate [LJG] (291) [JAB]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0053	8	1.0538	16	1.1136	24	1.1791
2	1.0120	10	1.0683	18	1.1294		
4	1.0257	12	1.0831	20	1.1456		
6	1.0396	14	1.0982	22	1.1622		

BaC₄H₄O₅, Malate [LJG] (546) [JAB]

%	1	2	4	6	8	10
d_4^{20}	1.0064	1.0146	1.0311	1.0475	1.0640	1.0804

Ba(CNS)₂ [GS]; with 11.26%, $d_4^{25} = 1.0918$; $d_4^{75.2} = 1.0659$ (629)

Ba(CN)₂·2CuCN [WCS]; $d_4^{20} = 1.0395$ with 6%; = 1.0565 with 8% (602)

LiOH [JAB] (73, 290)**; (225, 342, 519, 529)

%	0°C	10°C	20°C	25°C	30°C
1	1.0122	1.0115	1.0102	1.0090	1.0075
2	1.0240	1.0230	1.0217	1.0203	1.0188
4	1.0468	1.0456	1.0437	1.0422	1.0407
6	1.0690	1.0674	1.0650	1.0636	1.0621
8	1.0908	1.0888	1.0862	1.0847	1.0830
10	1.1125	1.1102	1.1074	1.1057	1.1038

%	40°C	50°C	60°C	80°C
1	1.0041	1.0000	0.9958	0.9860
2	1.0155	1.0114	1.0072	0.9973
4	1.0371	1.0331	1.0286	1.0189
6	1.0582	1.0541	1.0496	1.0397
8	1.0790	1.0747	1.0701	1.0600
10	1.0996	1.0952	1.0906	1.0803

LiCl, Main Table, p. 77

% (373)	0.01	0.02	0.03	0.04
$d_4^{20.004}$	0.998 29085	0.998 34984	0.998 40875	0.998 46760

LiClO₃ [JAB] (288)**; (442) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0048	6	1.0365	12	1.0764	18	1.1190
2	1.0111	8	1.0495	14	1.0903		
4	1.0237	10	1.0628	16	1.1045		

LiCl [JAB] (26), α (364, 367, 370)**; (25, 150, 250, 256)*; (1, 36, 38, 45, 64, 73, 106, 125, 204, 206, 219, 221, 223, 224, 225, 239, 274, 304, 312, 313, 342, 344, 347, 363, 374, 379, 386, 486, 487, 519, 529, 530, 573, 618, 629, 633), α (38, 151, 219, 256, 448, 606, 609)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00604	1.00574	1.00411	1.00292	1.00150	0.99806	0.99391	0.9891	0.9779	0.9646
2	1.01213	1.01168	1.00993	1.00870	1.00726	1.00381	0.99969	0.9950	0.9838	0.9708
4	1.02417	1.02344	1.02148	1.02019	1.01872	1.01527	1.01121	1.0066	0.9958	0.9831
6	1.03606	1.03509	1.03296	1.03161	1.03012	1.02668	1.02269	1.0182	1.0077	0.9953
8	1.04787	1.04670	1.04443	1.04303	1.04152	1.03809	1.03418	1.0298	1.0196	1.0076
10	1.05966	1.05833	1.05594	1.05449	1.05296	1.04954	1.04571	1.0414	1.0315	1.0199
12	1.07148	1.07002	1.06752	1.06602	1.06447	1.06107	1.05731	1.0532	1.0435	1.0322
14	1.08337	1.08180	1.07919	1.07765	1.07608	1.07271	1.06901	1.0650	1.0556	1.0447
16	1.09536	1.09369	1.09098	1.08941	1.08782	1.08449	1.08084	1.0769	1.0679	1.0572
18	1.10749	1.10571	1.10292	1.10132	1.09972	1.09643	1.09283	1.0890	1.0802	1.0700
20	1.11979	1.11789	1.11504	1.11342	1.11181	1.10855	1.10500	1.1013	1.0927	1.0829
22	1.13228	1.13027	1.12736	1.12574	1.12412	1.12088	1.11738	1.1137	1.1053	1.0960
24	1.14499	1.14287	1.13991	1.13831	1.13667	1.13344	1.12999	1.1264	1.1181	1.1093
26	1.15794	1.15571	1.15271	1.15115	1.14949	1.14625	1.14285	1.1393	1.1310	1.1228
28	1.17115	1.16881	1.16578	1.16428	1.16260	1.15933	1.15598	1.1525	1.1442	1.1367
30	1.18464	1.18219	1.17914	1.17771	1.17602	1.17269	1.16940	1.1659	1.1576	1.1507
35				1.21274	1.21092	1.20738	1.20402			
40				1.25002	1.24806	1.24427	1.24081			
45				1.28980	1.28768	1.28361	1.28003			

LiBr [JAB] (26), α (367)**; (25, 287)*; (45, 221, 319, 322, 366, 519, 618), α (151)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00731	1.00705	1.00547	1.00428	1.00285	0.99939	0.99519	0.9904	0.9790	0.9656
2	1.01484	1.01447	1.01280	1.01158	1.01013	1.00663	1.00241	0.9976	0.9862	0.9729
4	1.03012	1.02953	1.02769	1.02642	1.02492	1.02135	1.01708	1.0123	1.0009	0.9877
6	1.04574	1.04494	1.04293	1.04161	1.04006	1.03642	1.03211	1.0273	1.0159	1.0029
8	1.06173	1.06072	1.05854	1.05717	1.05557	1.05186	1.04752	1.0427	1.0313	1.0184
10	1.07812	1.07690	1.07455	1.07313	1.07148	1.06770	1.06334	1.0585	1.0471	1.0344
12	1.09493	1.09351	1.09099	1.08952	1.08782	1.08397	1.07959	1.0747	1.0634	1.0508
14	1.11219	1.11057	1.10789	1.10636	1.10461	1.10069	1.09629	1.0914	1.0801	1.0676
16	1.12993	1.12811	1.12528	1.12368	1.12188	1.11789	1.11347	1.1086	1.0972	1.0849
18	1.14817	1.14616	1.14318	1.14151	1.13965	1.13560	1.13115	1.1262	1.1149	1.1027
20	1.16695	1.16476	1.16162	1.15988	1.15795	1.15384	1.14936	1.1444	1.1331	1.1210
22	1.18631	1.18394	1.18063	1.17882	1.17682	1.17264	1.16813	1.1632	1.1519	1.1399
24	1.20628	1.20372	1.20024	1.19835	1.19629	1.19204	1.18750	1.1826	1.1713	1.1593
26	1.22689	1.22413	1.22047	1.21850	1.21639	1.21207	1.20750	1.2026	1.1913	1.1794
28	1.24817	1.24520	1.24135	1.23931	1.23716	1.23277	1.22815	1.2232	1.2119	1.2001
30	1.27017	1.26697	1.26292	1.26081	1.25862	1.25417	1.24949	1.2445	1.2333	1.2215
35	1.32850	1.32477	1.32040	1.31813	1.31582	1.31115	1.30629	1.3012	1.2899	1.2782
40	1.39233	1.38827	1.38360	1.38117	1.37871	1.37376	1.36869	1.3635	1.3520	1.3404
45	1.46259	1.45851	1.45354	1.45095	1.44829	1.44299	1.43767	1.4323	1.4207	1.4092
50				1.52878	1.52584	1.52010	1.51448	1.5089	1.4971	
55				1.61637	1.61302	1.60673	1.60074	1.5948	1.5829	
60				1.71595	1.71198	1.70499	1.69853	1.6923	1.6800	
65				1.83037	1.82547	1.81756	1.81049	1.8038	1.7913	

LiI [JAB] (26), α (369)**; (25, 287)*; (45, 221, 225, 261, 319, 320, 322, 342, 519, 618), α (151)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00746	1.00721	1.00563	1.00443	1.00300	0.99952	0.99530	0.9905	0.9790	0.9655
2	1.01514	1.01479	1.01312	1.01189	1.01043	1.00690	1.00264	0.9978	0.9863	0.9728
4	1.03083	1.03027	1.02843	1.02712	1.02560	1.02198	1.01763	1.0127	1.0011	0.9876
6	1.04697	1.04620	1.04418	1.04279	1.04120	1.03749	1.03305	1.0281	1.0163	1.0028
8	1.06358	1.06260	1.06039	1.05892	1.05726	1.05345	1.04892	1.0439	1.0320	1.0184
10	1.08069	1.07949	1.07708	1.07553	1.07380	1.06988	1.06527	1.0601	1.0481	1.0345
12	1.09832	1.09689	1.09428	1.09265	1.09085	1.08681	1.08212	1.0769	1.0648	1.0512
14	1.11649	1.11483	1.11202	1.11031	1.10844	1.10427	1.09950	1.0942	1.0819	1.0683
16	1.13523	1.13334	1.13033	1.12854	1.12660	1.12229	1.11744	1.1121	1.0996	1.0860
18	1.15457	1.15245	1.14924	1.14736	1.14535	1.14091	1.13597	1.1305	1.1179	1.1042
20	1.17455	1.17220	1.16878	1.16680	1.16472	1.16016	1.15512	1.1496	1.1368	1.1231
22	1.19520	1.19263	1.18898	1.18690	1.18475	1.18007	1.17491	1.1693	1.1564	1.1427
24	1.21656	1.21377	1.20988	1.20770	1.20547	1.20067	1.19538	1.1896	1.1766	1.1629
26	1.23867	1.23566	1.23152	1.22924	1.22692	1.22199	1.21657	1.2107	1.1976	1.1838
28	1.26156	1.25833	1.25395	1.25157	1.24915	1.24407	1.23853	1.2326	1.2193	1.2054

LiI.—(Continued)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
30	1.28527	1.28181	1.27720	1.27472	1.27219	1.26695	1.26130	1.2553	1.2418	1.2279
35	1.34859	1.34444	1.33928	1.33656	1.33382	1.32816	1.32218	1.3159	1.3020	1.2879
40	1.41839	1.41355	1.40783	1.40485	1.40188	1.39580	1.38948	1.3829	1.3686	1.3542
45	1.49582	1.49029	1.48399	1.48073	1.47751	1.47099	1.46433	1.4575	1.4426	1.4280
50	1.58235	1.57613	1.56922	1.56565	1.56215	1.55517	1.54816	1.5410	1.5255	1.5105
55	1.67986	1.67295	1.66538	1.66145	1.65764	1.65018	1.64279	1.6352	1.6192	1.6038
60	1.79074	1.78314	1.77481	1.77046	1.76631	1.75835	1.75052	1.7425	1.7260	1.7100
65				1.89559	1.89107	1.88259	1.87421	1.8658	1.8489	

LiIO₃ [JAB] (288)**; (250)* [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0072	10	1.0915	20	1.2023	30	1.3328
2	1.0160	12	1.1120	22	1.2268	32	1.3619
4	1.0339	14	1.1333	24	1.2520	34	1.3925
6	1.0525	16	1.1555	26	1.2780	36	1.4248
8	1.0717	18	1.1785	28	1.3049	38	1.4590

Li₂SO₄ [JAB] (250, 291), α (370)**; (616), α (203)*; (1, 76, 106, 150, 204, 225, 312, 342, 344, 405, 477, 519, 529, 618, 629), α (151)

%	1	2	4	6	8	10
0°C	1.0089	1.0179	1.0360	1.0543	1.0726	1.0910
10°C	1.0084	1.0173	1.0350	1.0528	1.0709	1.0890
20°C	1.0068	1.0155	1.0329	1.0505	1.0684	1.0863
25°C	1.0056	1.0142	1.0316	1.0491	1.0669	1.0848
30°C	1.0042	1.0128	1.0301	1.0476	1.0653	1.0831
40°C	1.0007	1.0092	1.0264	1.0439	1.0615	1.0792
50°C	0.9964	1.0049	1.0221	1.0396	1.0572	1.0749
60°C	0.9917	1.0001	1.0174	1.0349	1.0526	1.0703
80°C	0.9801	0.9886	1.0061	1.0238	1.0416	1.0595
100°C	0.9669	0.9756	0.9932	1.0111	1.0292	1.0474

%	12	14	16	18	20	22	24
0°C	1.1095	1.1280	1.1465	1.1656			
10°C	1.1073	1.1256	1.1441	1.1629			
20°C	1.1044	1.1228	1.1411	1.1599	1.1789	1.1984	1.2182
25°C	1.1029	1.1212	1.1394	1.1582			
30°C	1.1012	1.1193	1.1376	1.1565			
40°C	1.0972	1.1153	1.1335	1.1526			
50°C	1.0929	1.1109	1.1291	1.1483			
60°C	1.0882	1.1063	1.1246	1.1437			
80°C	1.0776	1.0959	1.1143	1.1335			
100°C	1.0658	1.0844	1.1028	1.1220			

LiNO₃ [JAB] (10, 84, 287), α (256, 370)**; α (203)*; (45, 106, 150, 250, 256, 342, 485, 517, 519, 529), α (151, 605)

%	1	2	4	6	8	10
0°C	1.00616	1.01253	1.02533	1.03826	1.05135	1.06461
10°C	1.00578	1.01188	1.02418	1.03667	1.04935	1.06222
20°C	1.00409	1.01002	1.02198	1.03413	1.04647	1.05903
25°C	1.00287	1.00872	1.02054	1.03255	1.04477	1.05721
30°C	1.00142	1.00721	1.01892	1.03081	1.04291	1.05524
40°C	0.99788	1.00358	1.01509	1.02681	1.03875	1.05091
50°C	0.99365	0.99929	1.01068	1.02227	1.03406	1.04607
60°C	0.9888	0.9944	1.0057	1.0172	1.0289	1.0409
80°C	0.9774	0.9829	0.9942	1.0056	1.0173	1.0291
100°C	0.9639	0.9695	0.9808	0.9922	1.0039	1.0157

%	12	14	16	18	20	22
0°C	1.07804	1.09168	1.10554	1.11965	1.13401	1.14862
10°C	1.07529	1.08857	1.10208	1.11585	1.12989	1.14422
20°C	1.07181	1.08482	1.09807	1.11159	1.12539	1.13948
25°C	1.06987	1.08276	1.09590	1.10931	1.12300	1.13699
30°C	1.06780	1.08059	1.09363	1.10694	1.12053	1.13442

LiNO₃—(Continued)

%	12	14	16	18	20	22
40°C	1.06330	1.07591	1.08877	1.10190	1.11532	1.12904
50°C	1.05830	1.07077	1.08349	1.09650	1.10980	1.12341
60°C	1.0530	1.0653	1.0780	1.0908	1.1040	1.1176
80°C	1.0411	1.0534	1.0659	1.0787	1.0918	1.1052
100°C	1.0278	1.0401	1.0527	1.0655	1.0786	1.0919

%	24	26	28	30	35	40
0°C	1.16351	1.17866	1.19406	1.20971	1.2510	
10°C	1.15883	1.17373	1.18893	1.20435	1.2451	
20°C	1.15387	1.16857	1.18355	1.19879	1.2392	1.2837
25°C	1.15128	1.16588	1.18076	1.19592	1.2361	1.2804
30°C	1.14861	1.16311	1.17790	1.19298	1.2330	1.2771
40°C	1.14308	1.15744	1.17209	1.18703	1.2267	1.2706
50°C	1.13734	1.15159	1.16613	1.18097	1.2204	1.2640
60°C	1.1314	1.1456	1.1601	1.1748	1.2139	1.2572
80°C	1.1189	1.1330	1.1473	1.1619	1.2007	1.2436
100°C	1.1056	1.1196	1.1338	1.1484	1.1870	1.2296

Li₂C₂O₄, Oxalate [JAB]; with 3.31 %, $d_4^{21.6} = 1.0232$ (329)

LiCHO₂, Formate [JAB] (291)**; (329)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0035	6	1.0285	12	1.0588	18	1.0896
2	1.0085	8	1.0385	14	1.0690	20	1.1000
4	1.0185	10	1.0486	16	1.0793		

LiC₂H₃O₂, Acetate [JAB] (288)**; (529)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0024	8	1.0297	16	1.0616	24	1.0947
2	1.0063	10	1.0376	18	1.0698		
4	1.0141	12	1.0455	20	1.0780		
6	1.0219	14	1.0535	22	1.0863		

LiC₄H₅O₅, Acid malate [JAB] (546)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0033	10	1.0496	20	1.1031	30	1.1594
2	1.0084	12	1.0601	22	1.1141	35	1.1887
4	1.0186	14	1.0707	24	1.1253	40	1.2189
6	1.0288	16	1.0814	26	1.1366	45	1.2502
8	1.0391	18	1.0922	28	1.1480	50	1.2829

Li₂C₄H₄O₄, Succinate [JAB]; with 8.58 %, $d_4^{23.0} = 1.0468$ (329)

Li₂C₄H₄O₆, Malate [JAB] (546)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0043	10	1.0600	20	1.1231	30	1.1880
2	1.0105	12	1.0725	22	1.1360	35	1.2210
4	1.0228	14	1.0851	24	1.1489	40	1.2545
6	1.0352	16	1.0977	26	1.1619		
8	1.0476	18	1.1103	28	1.1749		

Li₂C₄H₄O₆, Tartrate [JAB]; with 8.56 %, $d_4^{23.0} = 1.0530$ (329)

LiCNS [JAB] (291) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0025	6	1.0220	12	1.0458	18	1.0700
2	1.0064	8	1.0299	14	1.0538		
4	1.0142	10	1.0378	16	1.0619		

Li₂CrO₄ [JAB] (288) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0072	6	1.0508	12	1.1052	18	1.1627
2	1.0158	8	1.0686	14	1.1240	20	1.1826
4	1.0332	10	1.0867	16	1.1432	22	1.2028

Li₂Cr₂O₇ [JAB] (291) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0055	6	1.0412	12	1.0868	18	1.1355
2	1.0125	8	1.0561	14	1.1026	20	1.1528
4	1.0267	10	1.0713	16	1.1188		

NaOH [BTB] (63); (12, 98, 106, 248, 279, 290, 328, 342, 378, 387, 432, 449, 451, 463, 492, 519, 529, 555, 586, 639, 646, 666), α (211)**

%	0°C	10°C	15°C	18°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°C	100°C
1	1.0124	1.0115	1.01065	1.01003	1.0095	1.0069	1.0033	0.9990	0.9941	0.9884	0.9824	0.9760	0.9693
2	1.0244	1.0230	1.02198	1.02127	1.0207	1.0177	1.0139	1.0095	1.0045	0.9989	0.9929	0.9865	0.9797
3	1.0364	1.0345	1.03322	1.03241	1.0318	1.0285	1.0246	1.0201	1.0150	1.0094	1.0035	0.9970	0.9903
4	1.0482	1.0459	1.04441	1.04349	1.0428	1.0393	1.0352	1.0305	1.0254	1.0198	1.0139	1.0075	1.0009
5	1.0598	1.0571	1.05554	1.05454	1.0538	1.0501	1.0458	1.0412	1.0359	1.0302	1.0243	1.0179	1.0115
6	1.0713	1.0683	1.06666	1.06559	1.0648	1.0609	1.0564	1.0517	1.0463	1.0407	1.0347	1.0284	1.0220
7	1.0828	1.0795	1.07777	1.07664	1.0758	1.0717	1.0672	1.0623	1.0569	1.0513	1.0453	1.0390	1.0326
8	1.0943	1.0908	1.08887	1.08769	1.0869	1.0826	1.0780	1.0730	1.0676	1.0619	1.0560	1.0497	1.0432
9	1.1057	1.1020	1.09997	1.09872	1.0979	1.0934	1.0887	1.0836	1.0782	1.0725	1.0665	1.0602	1.0537
10	1.1171	1.1132	1.11107	1.10977	1.1089	1.1043	1.0995	1.0942	1.0889	1.0831	1.0771	1.0708	1.0643
12	1.1399	1.1355	1.13327	1.13188	1.1309	1.1261	1.1210	1.1157	1.1101	1.1043	1.0983	1.0920	1.0855
14	1.1624	1.1578	1.15545	1.15400	1.1530	1.1480	1.1428	1.1373	1.1316	1.1257	1.1195	1.1132	1.1066
16	1.1849	1.1801	1.17761	1.17610	1.1751	1.1699	1.1645	1.1588	1.1531	1.1471	1.1408	1.1343	1.1277
18	1.2073	1.2023	1.19973	1.19817	1.1972	1.1918	1.1963	1.1805	1.1746	1.1685	1.1621	1.1556	1.1489
20	1.2296	1.2244	1.22183	1.22022	1.2191	1.2136	1.2079	1.2020	1.1960	1.1898	1.1833	1.1768	1.1700
22	1.2519	1.2465	1.24386	1.24220	1.2411	1.2454	1.2296	1.2236	1.2174	1.2111	1.2046	1.1980	1.1912
24	1.2741	1.2686	1.26582	1.26412	1.2629	1.2571	1.2512	1.2451	1.2388	1.2324	1.2259	1.2192	1.2124
26	1.2963	1.2906	1.2877	1.2860	1.2848	1.2789	1.2728	1.2666	1.2603	1.2538	1.2472	1.2405	1.2336
28	1.3182	1.3124	1.3094	1.3076	1.3064	1.3002	1.2942	1.2878	1.2814	1.2750	1.2682	1.2615	1.2546
30	1.3400†	1.3340	1.3309	1.3290	1.3279	1.3217	1.3154	1.3090	1.3025	1.2959	1.2892	1.2824	1.2755
32	1.3614	1.3552	1.3520	1.3502	1.3490	1.3427	1.3362	1.3298	1.3232	1.3165	1.3097	1.3029	1.2960
34	1.3823	1.3760	1.3728	1.3708	1.3696	1.3632	1.3566	1.3501	1.3434	1.3367	1.3299	1.3230	1.3161
36	1.4030	1.3965	1.3933	1.3913	1.3900	1.3835	1.3768	1.3702	1.3634	1.3567	1.3498	1.3429	1.3360
38	1.4234	1.4168	1.4135	1.4115	1.4101	1.4035	1.3967	1.3900	1.3832	1.3763	1.3695	1.3626	1.3556
40	1.4435	1.4367	1.4334	1.4314	1.4300	1.4232	1.4164	1.4095	1.4027	1.3958	1.3889	1.3820	1.3750
42	1.4632	1.4561	1.4529	1.4508	1.4494	1.4425	1.4356	1.4287	1.4217	1.4148	1.4079	1.4009	1.3940
44	1.4825	1.4755	1.4720	1.4699	1.4685	1.4615	1.4545	1.4475	1.4405	1.4335	1.4266	1.4196	1.4127
46	1.5018	1.4947†	1.4911	1.4890	1.4873	1.4805	1.4734	1.4663	1.4593	1.4523	1.4454	1.4384	1.4315
48	1.5210	1.5138	1.5102	1.5080	1.5065	1.4994	1.4922	1.4851	1.4781	1.4711	1.4641	1.4572	1.4503
50	1.5400	1.5326	1.5290	1.5268	1.5253	1.5181	1.5109	1.5038	1.4967	1.4897	1.4827	1.4759	1.4690

† Supersaturated.

NaCl [JAB] (24, 258); (20, 25, 59, 62, 84, 110, 250, 256), α (256, 364, 367, 370)*; (1, 2, 18, 26, 27, 36, 37, 38, 45, 57, 86, 101, 105, 106, 125, 136, 144, 145, 151, 190, 200, 206, 215, 219, 221, 223, 224, 225, 228, 246, 255, 261, 273, 274, 278, 297, 312, 313, 331, 342, 344, 347, 360, 361, 378, 409, 418, 425, 429, 447, 448, 449, 450, 451, 452, 459, 486, 505, 514, 517, 519, 526, 529, 533, 536, 545, 547, 553, 573, 592, 618, 630, 632, 644), α (37, 38, 151, 211, 219, 271, 448, 466, 545, 555, 606, 609)**

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00747	1.00707	1.00534	1.00409	1.00261	0.99908	0.99482	0.9900	0.9785	0.9651
2	1.01509	1.01442	1.01246	1.01112	1.00957	1.00593	1.00161	0.9967	0.9852	0.9719
4	1.03038	1.02920	1.02680	1.02530	1.02361	1.01977	1.01531	1.0103	0.9988	0.9855
6	1.04575	1.04408	1.04127	1.03963	1.03781	1.03378	1.02919	1.0241	1.0125	0.9994
8	1.06121	1.05907	1.05589	1.05412	1.05219	1.04798	1.04326	1.0381	1.0264	1.0134
10	1.07677	1.07419	1.07068	1.06879	1.06676	1.06238	1.05753	1.0523	1.0405	1.0276
12	1.09244	1.08946	1.08566	1.08365	1.08153	1.07699	1.07202	1.0667	1.0549	1.0420
14	1.10824	1.10491	1.10085	1.09872	1.09651	1.09182	1.08674	1.0813	1.0694	1.0565
16	1.12419	1.12056	1.11621	1.11401	1.11171	1.10688	1.10170	1.0962	1.0842	1.0713
18	1.14031	1.13643	1.13190	1.12954	1.12715	1.12218	1.11691	1.1113	1.0993	1.0864
20	1.15663	1.15254	1.14779	1.14533	1.14285	1.13774	1.13238	1.1268	1.1146	1.1017
22	1.17318	1.16891	1.16395	1.16140	1.15883	1.15358	1.14812	1.1425	1.1303	1.1172
24	1.18999	1.18557	1.18040	1.17776	1.17511	1.16971	1.16414	1.1584	1.1463	1.1331
26	1.20709	1.20254	1.19717	1.19443	1.19170	1.18614	1.18045	1.1747	1.1626	1.1492

NaCl (348, 349, 586)**

%	$d_4^{14.07}$	$d_4^{18.56}$	%	$d_4^{18.56}$
0.5	1.002 886	1.002 112	2.0	1.012 856
1.0	1.006 506	1.005 694	2.5	1.016 440
1.5	1.010 120	1.009 274	3.0	1.020 024

NaF [JAB] (288); (190, 224)**

%	1	2	3	4	5
d_4^{18}	1.0092	1.0198	1.0304	1.0409	1.0515

NaCl.—(Continued)

% (588)	d_4^{110}	d_4^{120}	d_4^{130}
2.71	0.9697	0.9618	0.9537
5.32	0.9868	0.9791	0.9709
10.88	1.0269	1.0189	1.0115

NaClO₃ [JAB] (288)**; (360, 361, 378, 449, 514, 529, 561) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0053	10	1.0681	20	1.1449	30	1.2307
2	1.0121	12	1.0827	22	1.1614	32	1.2491
4	1.0258	14	1.0977	24	1.1782	34	1.2680
6	1.0397	16	1.1131	26	1.1953		
8	1.0538	18	1.1288	28	1.2128		

NaCl.—(Continued)

% (373)	$d_4^{20.004}$	% (373)	$d_4^{20.004}$
0.01	0.998 30415	0.04	0.998 52027
0.02	0.998 37629	0.05	0.998 59246
0.03	0.998 44808	0.06	0.998 66466

NaClO₄ [LJG] (291)**; (514, 529)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0051	10	1.0656	20	1.1396	30	1.2227
2	1.0116	12	1.0798	22	1.1554	32	1.2407
4	1.0247	14	1.0943	24	1.1717	34	1.2591
6	1.0381	16	1.1090	26	1.1883	36	1.2779
8	1.0517	18	1.1241	28	1.2053	38	1.2969

NaBr [JAB] (26), α (367)**; (25, 287)*; (1, 12, 36, 106, 144, 189, 190, 221, 228, 246, 261, 307, 312, 313, 319, 320, 322, 323, 360, 361, 378, 447, 451, 459, 514, 519, 547, 573, 596, 618), α (151, 607)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00798	1.00765	1.00599	1.00476	1.00331	0.99979	0.99555	0.9907	0.9792	0.9657
2	1.01618	1.01566	1.01385	1.01255	1.01104	1.00743	1.00312	0.9982	0.9867	0.9731
4	1.03285	1.03196	1.02984	1.02840	1.02678	1.02299	1.01854	1.0135	1.0018	0.9882
6	1.04991	1.04866	1.04623	1.04465	1.04292	1.03895	1.03436	1.0293	1.0174	1.0037
8	1.06739	1.06579	1.06305	1.06133	1.05949	1.05534	1.05061	1.0454	1.0334	1.0196
10	1.08532	1.08338	1.08033	1.07847	1.07652	1.07219	1.06732	1.0620	1.0498	1.0359
12	1.10373	1.10146	1.09810	1.09610	1.09404	1.08953	1.08452	1.0791	1.0667	1.0526
14	1.12265	1.12005	1.11638	1.11424	1.11207	1.10738	1.10223	1.0967	1.0842	1.0699
16	1.14210	1.13917	1.13519	1.13292	1.13063	1.12576	1.12047	1.1148	1.1021	1.0876
18	1.16210	1.15885	1.15455	1.15217	1.14975	1.14470	1.13927	1.1335	1.1206	1.1059
20	1.18268	1.17911	1.17449	1.17207	1.16946	1.16423	1.15866	1.1527	1.1396	1.1247
22	1.20387	1.19997	1.19505	1.19249	1.18980	1.18439	1.17867	1.1726	1.1592	1.1442
24	1.22569	1.22147	1.21627	1.21360	1.21079	1.20520	1.19932	1.1931	1.1795	1.1642
26	1.24817	1.24364	1.23817	1.23538	1.23246	1.22669	1.22064	1.2143	1.2004	1.1849
28	1.27135	1.26652	1.26078	1.25786	1.25484	1.24889	1.24267	1.2362	1.2221	1.2063
30	1.29526	1.29014	1.28413	1.28107	1.27795	1.27182	1.26544	1.2588	1.2444	1.2284
35	1.35860	1.35284	1.34615	1.34277	1.33934	1.33271	1.32594	1.3190	1.3039	1.2873
40	1.42734	1.42124	1.41384	1.41017	1.40643	1.39928	1.39219	1.3849	1.3691	1.3520

NaBrO₃, see p. 81NaI [JAB] (26), α (368)**; (25, 287)*; (2, 12, 36, 106, 144, 189, 190, 221, 225, 246, 261, 312, 319, 322, 342, 365, 447, 487, 507, 519, 547, 596, 618), α (151)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00789	1.00759	1.00596	1.00474	1.00329	0.99977	0.99553	0.9906	0.9791	0.9656
2	1.01603	1.01557	1.01380	1.01253	1.01103	1.00742	1.00310	0.9981	0.9865	0.9730
4	1.03264	1.03186	1.02981	1.02843	1.02683	1.02304	1.01857	1.0135	1.0016	0.9879
6	1.04972	1.04862	1.04629	1.04479	1.04309	1.03912	1.03450	1.0293	1.0172	1.0033
8	1.06729	1.06587	1.06326	1.06164	1.05983	1.05568	1.05091	1.0455	1.0332	1.0191
10	1.08538	1.08364	1.08075	1.07900	1.07708	1.07275	1.06782	1.0623	1.0496	1.0354
12	1.10402	1.10196	1.09878	1.09690	1.09487	1.09035	1.08525	1.0795	1.0666	1.0522
14	1.12324	1.12086	1.11738	1.11537	1.11322	1.10851	1.10323	1.0974	1.0842	1.0696
16	1.14307	1.14037	1.13658	1.13444	1.13217	1.12726	1.12179	1.1158	1.1023	1.0875
18	1.16354	1.16052	1.15641	1.15414	1.15175	1.14663	1.14097	1.1348	1.1211	1.1060
20	1.18469	1.18134	1.17691	1.17450	1.17199	1.16665	1.16080	1.1545	1.1405	1.1251
22	1.20655	1.20287	1.19812	1.19556	1.19293	1.18736	1.18132	1.1748	1.1605	1.1450
24	1.22915	1.22514	1.22007	1.21736	1.21460	1.20880	1.20257	1.1959	1.1813	1.1655
26	1.25252	1.24819	1.24279	1.23993	1.23704	1.23101	1.22459	1.2177	1.2029	1.1869
28	1.27669	1.27205	1.26631	1.26331	1.26029	1.25403	1.24741	1.2403	1.2252	1.2090
30	1.30171	1.29674	1.29067	1.28754	1.28437	1.27789	1.27107	1.2638	1.2484	1.2320
35	1.36842	1.36248	1.35562	1.35217	1.34869	1.34164	1.33429	1.3265	1.3103	1.2933
40	1.44158	1.43476	1.42711	1.42334	1.41954	1.41189	1.40399	1.3957	1.3785	1.3608
45	1.52224	1.51463	1.50620	1.50211	1.49799	1.48970	1.48122	1.4723	1.4541	1.4357
50	1.61168	1.60336	1.59418	1.58977	1.58534	1.57636	1.57626	1.5577	1.5385	1.5193
55	1.71152	1.70256	1.69268	1.68795	1.68323	1.67350	1.66373	1.6536	1.6331	1.6144
60	1.82382	1.81428	1.80377	1.79872	1.79373	1.78319	1.77269	1.7619	1.7405	1.7220

NaBrO₃ [JAB] (291); (360, 361, 378) [LJG]**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0064	8	1.0641	16	1.1373	24	1.2193
2	1.0143	10	1.0816	18	1.1569		
4	1.0305	12	1.0996	20	1.1771		
6	1.0471	14	1.1182	22	1.1979		

NaIO₃ [LJG] (250, 363, 529)

%	d_4^{18}	%	d_4^{25}	%	$d_4^{19.5}$
3.83	1.0333	4.95	1.0415	7.52	1.068

NaPO₃ [LJG] (28, 206); (451)**

%	1	2	4	6	8
d_4^{20}	1.0064	1.0145	1.0304	1.0461	1.0614

Na₃PO₄ [LJG] (536); (206, 463, 537)**

%	1	2	4	6	8	10
d_4^{15}	1.0092	1.0194	1.0405	1.0624	1.0850	1.1083

Na₄P₂O₇ [LJG] (206, 451)

%	1	2	3	4
d_4^{20}	1.0090	1.0190	1.0283	1.0369

NaH₂PO₃ [LJG]; with 3.47 %, $d_4^{20} = 1.0218$ (463)**Na₂HPO₃ [LJG]; with 3.15 %, $d_4^{20} = 1.0277$ (463)****NaH₂PO₄ [LJG] (514)**; (432, 451, 463)**

%	1	2	4	6	8	10
d_4^{25}	1.0045	1.0120	1.0270	1.0422	1.0575	1.0730

Na₂HPO₄ [LJG] (432); (533)*; (98, 241, 242, 451, 534, 561)**

%	1	2	4	6
d_4^{18}	1.009	1.020	1.043	1.067

Na₂S [JAB] (52) [LJG]

%	d_4^{18}	%	d_4^{18}
1	1.0098	10	1.1146
2	1.0211	12	1.1388
4	1.0440	14	1.1634
6	1.0672	16	1.1885
8	1.0907	18	1.2140

Na₂SO₃ [JAB] (106) [LJG]

%	d_4^{19}	%	d_4^{19}
1	1.0078	10	1.0948
2	1.0172	12	1.1146
4	1.0363	14	1.1346
6	1.0556	16	1.1549
8	1.0751	18	1.1755

Na₂SO₄ [JAB] (20, 229.5, 409, 603), α (370); (1, 2, 14, 36, 85, 86, 101, 106, 144, 146, 147, 151, 155, 187, 190, 192, 204, 206, 215, 219, 221, 223, 224, 225, 246, 261, 297, 312, 342, 344, 360, 361, 378, 385, 405, 422, 425, 449, 451, 477, 485, 519, 529, 533, 540, 544, 550, 585, 598, 618, 629, 646), α (151, 219, 271, 466)**

%	0°C	10°C	20°C	25°C	30°C
1	1.0094	1.0089	1.0073	1.0061	1.0046
2	1.0189	1.0182	1.0164	1.0151	1.0135
4	1.0381	1.0370	1.0348	1.0332	1.0315
6	1.0576	1.0560	1.0535	1.0515	1.0497
8	1.0773	1.0753	1.0724	1.0701	1.0682
10	1.0972	1.0948	1.0915	1.0890	1.0870
12	1.1174	1.1145	1.1109	1.1083	1.1062
14	1.1378	1.1345	1.1306	1.1279	1.1257
16	1.1585	1.1548	1.1506	1.1479	1.1456
18	1.1795	1.1754	1.1709	1.1683	1.1659
20	1.2008	1.1963	1.1915	1.1890	1.1865
22	1.2224	1.2175	1.2124	1.2102	1.2076
24	1.2443	1.2390	1.2336	1.2318	1.2292

Na₂SO₄—(Continued)

%	40°C	50°C	60°C	80°C	100°C
1	1.0010	0.9969	0.9919	0.9805	0.9671
2	1.0098	1.0057	1.0007	0.9892	0.9758
4	1.0276	1.0235	1.0184	1.0068	0.9934
6	1.0456	1.0415	1.0363	1.0246	1.0112
8	1.0639	1.0598	1.0544	1.0426	1.0292
10	1.0825	1.0783	1.0728	1.0609	1.0475
12	1.1015	1.0971	1.0915	1.0795	1.0661
14	1.1209	1.1162	1.1105	1.0984	1.0850
16	1.1406	1.1356	1.1299	1.1176	1.1042
18	1.1608	1.1553	1.1496	1.1371	
20	1.1813	1.1753	1.1696	1.1569	
22	1.2023				
24	1.2237				

% (586)	$d_4^{18.080}$	% (586)	$d_4^{18.080}$
0.1	0.999 533	0.5	1.003 207
0.2	1.000 455	0.6	1.004 121
0.3	1.001 375	0.7	1.005 033
0.4	1.002 292	0.8	1.005 943

% (588)	d_4^{110}	d_4^{120}	d_4^{130}	d_4^{140}
1.69	0.9654	0.9573	0.9494	0.9404
3.35	0.9797	0.9719	0.9638	0.9555

% (229.5)	d_4^{25}	d_4^{30}	d_4^{40}	% (229.5)	d_4^{25}	d_4^{30}	d_4^{40}
1	1.006102	1.004620	1.001048	16	1.147918	1.145583	1.140624
2	1.015094	1.013539	1.009849	17	1.158050	1.155673	1.150643
3	1.024117	1.022491	1.018688	18	1.168278	1.165859	1.160759
4	1.033195	1.031500	1.027583	19	1.178606	1.176147	1.170979
5	1.042330	1.040572	1.036552	20	1.189036	1.186539	1.181303
6	1.051530	1.049711	1.045594	21	1.199570	1.197035	1.191734
7	1.060798	1.058919	1.054708	22	1.210207	1.207635	1.202271
8	1.070134	1.068200	1.063899	23	1.220948	1.218340	1.212920
9	1.079547	1.077557	1.073166	24	1.231796	1.229152	1.223673
10	1.089043	1.087000	1.082524	25	1.242754	1.240078	1.234537
11	1.098627	1.096532	1.091972	26	1.253824	1.251115	1.245519
12	1.108303	1.106156	1.101510	27	1.265000	1.262260	1.256607
13	1.118071	1.115872	1.111143	28	1.276276	1.273506	1.267800
14	1.127929	1.125682	1.120873	(29)	(1.287664)		
15	1.137878	1.135586	1.130700				

Na₂S₂O₃ [JAB] (509, 510, 536); (137)*; (106, 537) [LJG]**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0065	10	1.0827	20	1.1740	30	1.2739
2	1.0148	12	1.1003	22	1.1932	35	1.3273
4	1.0315	14	1.1182	24	1.2128	40	1.3827
6	1.0483	16	1.1365	26	1.2328		
8	1.0654	18	1.1551	28	1.2532		

Na₂S₂O₆ [LJG]; with 2.58 %, $d_4^{25} = 1.0162$ (529)**NaHSO₄ [JAB] (409)**; (451, 458)*; (432)**

%	0°C	10°C	20°C	25°C	30°C
1	1.0083	1.0077	1.0059	1.0047	1.0032
2	1.0166	1.0157	1.0137	1.0124	1.0108
4	1.0335	1.0319	1.0293	1.0279	1.0261
6	1.0505	1.0482	1.0451	1.0435	1.0415
8	1.0676	1.0647	1.0611	1.0593	1.0571
10	1.0849	1.0814	1.0773	1.0753	1.0728
12	1.1023	1.0982	1.0937	1.0915	1.0887
14	1.1199	1.1152	1.1103	1.1079	1.1049
16	1.1376	1.1324	1.1271	1.1245	1.1214
18	1.1555	1.1499	1.1441	1.1413	1.1381
20	1.1736	1.1676	1.1614	1.1583	1.1551
22	1.1919	1.1856	1.1789	1.1755	1.1724

NaHSeO₃ [LJG]; with 5.03 %, $d_4^{20} = 1.0395$ (463)**Na₂SeO₃ [LJG]; with 4.32 %, $d_4^{20} = 1.0402$ (463)**

Na_2SeO_4 [JAB] (602) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0081	4	1.0355	8	1.0735	12	1.1129
2	1.0171	6	1.0543	10	1.0930	14	1.1333

 NaN_3 [LJG] (74)

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.0065	1.0060	1.0040	1.0030	1.0015	0.9975
2	1.013	1.012	1.010	1.009	1.007	1.003
4	1.026	1.024	1.022	1.021	1.019	1.015
6	1.039	1.037	1.034	1.033	1.031	1.027
8	1.052	1.050	1.047	1.045	1.043	1.039
10	1.065	1.063	1.059	1.057	1.055	1.051
12	1.079	1.076	1.072	1.070	1.068	1.063
14	1.093	1.089	1.085	1.083	1.081	1.076
16	1.107	1.103	1.099	1.096	1.094	1.089
18	1.121	1.117	1.112	1.109	1.107	1.102
20	1.136	1.131	1.126	1.123	1.121	1.115
22	1.151	1.146	1.140	1.137	1.135	1.129
24	1.166	1.161	1.155	1.152	1.149	1.143
26	1.182	1.176	1.170	1.167	1.164	1.157
28	1.199	1.192	1.186	1.182	1.179	1.172
30	1.216	1.209	1.202	1.198	1.195	1.188

%	50°C	60°C	70°C	80°C	90°C	100°C
1	0.9935	0.9885	0.9835	0.9775	0.9705	0.9635
2	0.999	0.994	0.988	0.983	0.976	0.969
4	1.010	1.005	1.000	0.994	0.987	0.980
6	1.022	1.016	1.011	1.005	0.998	0.991
8	1.034	1.028	1.022	1.016	1.009	1.002
10	1.046	1.040	1.034	1.028	1.021	1.014
12	1.058	1.052	1.046	1.040	1.033	1.026
14	1.070	1.064	1.058	1.052	1.045	1.038
16	1.083	1.076	1.070	1.064	1.057	1.050
18	1.096	1.089	1.083	1.076	1.070	1.063
20	1.109	1.102	1.096	1.089	1.083	1.076
22	1.122	1.115	1.109	1.102	1.096	1.089
24	1.136	1.129	1.123	1.116	1.110	1.103
26	1.150	1.143	1.137	1.130	1.124	1.107
28	1.165	1.158	1.152	1.145	1.138	1.131
30	1.181	1.174	1.167	1.160	1.153	1.146

 NaNO_2 [JAB] (602) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0058	6	1.0397	12	1.0816	18	1.1248
2	1.0125	8	1.0535	14	1.0959	20	1.1394
4	1.0260	10	1.0675	16	1.1103		

NaNO_3 [JAB] (84, 110, 250, 256), α (256, 370)**; (20, 448, 449, 451, 452, 646), α (203, 211, 375, 466)*; (1, 36, 86, 106, 144, 190, 195, 206, 214, 215, 221, 223, 224, 225, 228, 246, 261, 312, 344, 360, 361, 378, 385, 422, 514, 519, 529, 533, 592, 593), α (151, 446, 605)

%	0°C	10°C	20°C	25°C	30°C
1	1.0071	1.0066	1.0049	1.0037	1.0022
2	1.0144	1.0136	1.0117	1.0104	1.0088
4	1.0290	1.0277	1.0254	1.0239	1.0221
6	1.0438	1.0420	1.0392	1.0376	1.0356
8	1.0587	1.0565	1.0532	1.0515	1.0493
10	1.0738	1.0712	1.0674	1.0656	1.0632
12	1.0891	1.0861	1.0819	1.0799	1.0774
14	1.1046	1.1012	1.0967	1.0945	1.0919
16	1.1203	1.1166	1.1118	1.1094	1.1067
18	1.1363	1.1323	1.1272	1.1246	1.1219
20	1.1526	1.1483	1.1429	1.1402	1.1374
22	1.1692	1.1645	1.1589	1.1561	1.1532
24	1.1860	1.1810	1.1752	1.1723	1.1693

 NaNO_3 —(Continued)

%	0°C	10°C	20°C	25°C	30°C
26	1.2031	1.1977	1.1917	1.1888	1.1856
28	1.2204	1.2147	1.2085	1.2055	1.2022
30	1.2380	1.2320	1.2256	1.2225	1.2191
35	1.2834	1.2770	1.2701	1.2668	1.2632
40	1.3316	1.3248	1.3175	1.3140	1.3102
45		1.3760	1.3683	1.3646	1.3607

%	40°C	50°C	60°C	80°C	100°C
1	0.9986	0.9944	0.9894	0.9779	0.9644
2	1.0050	1.0007	0.9956	0.9840	0.9704
4	1.0180	1.0135	1.0082	0.9964	0.9826
6	1.0312	1.0265	1.0210	1.0090	0.9951
8	1.0447	1.0397	1.0340	1.0218	1.0078
10	1.0584	1.0532	1.0473	1.0348	1.0208
12	1.0724	1.0669	1.0609	1.0481	1.0340
14	1.0867	1.0809	1.0749	1.0617	1.0475
16	1.1013	1.0953	1.0892	1.0757	1.0614
18	1.1162	1.1100	1.1038	1.0901	1.0756
20	1.1314	1.1250	1.1187	1.1048	1.0901
22	1.1470	1.1404	1.1340	1.1198	1.1049
24	1.1629	1.1561	1.1496	1.1351	1.1200
26	1.1791	1.1721	1.1655	1.1507	1.1355
28	1.1955	1.1884	1.1816	1.1667	1.1513
30	1.2122	1.2051	1.1980	1.1830	1.1674
35	1.2560	1.2486	1.2413	1.2258	1.2100
40	1.3027	1.2950	1.2875	1.2715	1.2555
45	1.3528	1.3448	1.3371	1.3206	1.3044

8.066 % (256)

°C	d_4^t	°C	d_4^t	°C	d_4^t
0	1.04834	25	1.05580	50	1.06777
10	1.05059	30	1.05791	4.141 % (256)	
20	1.05386	40	1.06260	20	1.02646

NaH_2AsO_4 [JAB] (514)**; (463) [LJG]		Na_2HAsO_4 [JAB] (536)**; (241, 242, 537) [LJG]		Na_3AsO_4 [JAB] (536)**; (206, 463) [LJG]	
%	d_4^{25}	%	d_4^{14}	%	d_4^{17}
1	1.0050	1	1.0083	1	1.0097
2	1.0129	2	1.0175	2	1.0207
4	1.0291	4	1.0365	4	1.0431
6	1.0457	6	1.0563	6	1.0659
8	1.0626	8	1.0768	8	1.0892
10	1.0798	10	1.0980	10	1.1130
12	1.0974	12	1.1197	12	1.1373
14	1.1153	14	1.1419		
		16	1.1645		

Na_2CO_3 [JAB] (219), α (219)**; (668)*; (68, 69, 71, 98, 190, 192, 206, 261, 271, 279, 312, 328, 342, 344, 348, 349, 432, 451, 519, 632, 637, 639)

%	0°C	10°C	15°C	20°C	25°C	30°C
1	1.0109	1.0103	1.0096	1.0086	1.0073	1.0058
2	1.0219	1.0210	1.0201	1.0190	1.0176	1.0159
4	1.0439	1.0423	1.0411	1.0398	1.0381	1.0363
6	1.0659	1.0636	1.0622	1.0606	1.0588	1.0568
8	1.0878	1.0850	1.0834	1.0816	1.0797	1.0775
10	1.1097	1.1065	1.1048	1.1029	1.1008	1.0986
12	1.1319	1.1284	1.1265	1.1244	1.1223	1.1200
14	1.1543	1.1506	1.1485	1.1463	1.1442	1.1417

%	30°C	%	40°C	50°C	60°C	70°C
16	1.1636	1	1.0022	0.9979	0.9929	0.9874
18	1.1859	2	1.0122	1.0078	1.0027	0.9970
20	1.2086	4	1.0323	1.0278	1.0223	1.0165

Na₂CO₃—(Continued)

%	30°C	%	40°C	50°C	60°C	70°C
22	1.2317	6	1.0527	1.0478	1.0422	1.0364
24	1.2552	8	1.0732	1.0681	1.0625	1.0565
26	1.2790	10	1.0939	1.0888	1.0830	1.0770
28	1.3031	12	1.1150	1.1097	1.1039	1.0978
30	1.3274	14	1.1365	1.1310	1.1251	1.1189

%	80°C	90°C	100°C	% (373)	$d_4^{20.004}$
1	0.9814	0.9750	0.9683	0.005	0.998 2840
2	0.9910	0.9847	0.9782	0.01	0.998 3370
4	1.0105	1.0042	0.9980	0.02	0.998 4432
6	1.0302	1.0241	1.0180	0.03	0.998 5496
8	1.0503	1.0441	1.0380	0.04	0.998 6560
10	1.0707	1.0644	1.0582	0.05	0.998 7625
12	1.0914	1.0850	1.0787		
14	1.1125	1.1059	1.0996		

Na₂C₂O₄, Oxalate [JAB] (376, 377, 451, 463, 632); (329)**

%	d_4^{20}	d_4^{25}	%	d_4^{20}	d_4^{25}
1	1.0064	1.0054	3	1.0229	1.0221
2	1.0147	1.0137	4	1.0312	

Na₂C₄O₄, Acetylenedicarboxylate [JAB]; $d_4^{25} = 1.0055$ with 1%; = 1.0143 with 2% (376)

NaCHO₂, Formate [JAB] (291, 484); (144, 329, 377, 378, 449, 463, 514, 632)**

%	d_4^{15}	d_4^{18}	d_4^{25}	%	d_4^{15}	d_4^{18}	d_4^{25}
1	1.005	1.0049	1.003	18	1.118	1.1164	1.114
2	1.012	1.0112	1.009	20	1.132	1.1300	1.127
4	1.025	1.0139	1.022	22	1.146	1.1439	1.141
6	1.038	1.0368	1.035	24	1.160	1.1580	1.155
8	1.051	1.0498	1.048	26	1.175		1.170
10	1.064	1.0630	1.061	28	1.189		1.184
12	1.077	1.0762	1.074	30	1.204		1.199
14	1.091	1.0895	1.087	35	1.242		1.236
16	1.104	1.1029	1.100	40	1.281		1.274

NaHCO₃ [JAB] (432); (144, 193, 241, 242, 509, 510) [LJG]**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0059	3	1.0206	5	1.0354	7	1.0505
2	1.0132	4	1.0280	6	1.0429	8	1.0581

NaC₂H₃O₂, Acetate [JAB] (288), α (271, 374); (515, 632)*; (18, 46, 134, 192, 208, 222, 223, 224, 342, 343, 362, 376, 377, 378, 388, 449, 451, 463, 484, 509, 514, 529, 586, 592, 602)**

%	10°C	18°C	20°C	25°C	30°C
1	1.0049	1.0037	1.0033	1.0021	1.0007
2	1.0101	1.0088	1.0084	1.0072	1.0057
4	1.0205	1.0191	1.0186	1.0173	1.0157
6	1.0310	1.0294	1.0289	1.0275	1.0258
8	1.0415	1.0397	1.0392	1.0377	1.0359
10	1.0520	1.0500	1.0495	1.0479	1.0461
12	1.0626	1.0604	1.0598	1.0582	1.0563
14	1.0733	1.0709	1.0702	1.0686	1.0666
16	1.0841	1.0815	1.0807	1.0790	1.0769
18	1.0950	1.0922	1.0913	1.0895	1.0873
20	1.1060	1.1030	1.1021	1.1001	1.0978
22	1.1171	1.1139	1.1130	1.1109	1.1085
24	1.1282	1.1249	1.1240	1.1218	1.1193
26	1.1394	1.1360	1.1351	1.1327	1.1302
28	1.1508	1.1472	1.1462	1.1437	1.1412

%	40°C	50°C	60°C	70°C	80°C
1	0.9971	0.9930	0.9881	0.9826	0.9766
2	1.0021	0.9979	0.9930	0.9875	0.9815
4	1.0120	1.0077	1.0028	0.9972	0.9912
6	1.0220	1.0176	1.0126	1.0070	1.0009

NaC₂H₃O₂—(Continued)

%	40°C	50°C	60°C	70°C	80°C
8	1.0320	1.0275	1.0224	1.0168	1.0107
10	1.0420	1.0375	1.0322	1.0266	1.0205
12	1.0521	1.0475	1.0421	1.0364	1.0303
14	1.0623	1.0575	1.0521	1.0463	1.0402
16	1.0725	1.0676	1.0621	1.0562	
18	1.0828	1.0778	1.0722	1.0662	
20	1.0931	1.0880	1.0824	1.0763	
22	1.1035	1.0983	1.0926	1.0865	
24	1.1141	1.1087	1.1029	1.0968	
26	1.1248	1.1192	1.1133	1.1072	
28	1.1355	1.1298	1.1238	1.1176	

NaC₂H₃O₃, Glycolate [JAB] (376); (378, 463)**

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0029	4	1.0206	7	1.0387
2	1.0087	5	1.0266	8	1.0448
3	1.0146	6	1.0326	9	1.0509

NaC₃H₅O₂, Propionate [JAB] (291); (377, 378, 463, 484, 514)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0030	8	1.0342	16	1.0705	24	1.1071
2	1.0075	10	1.0432	18	1.0796	26	1.1164
4	1.0164	12	1.0523	20	1.0887		
6	1.0253	14	1.0614	22	1.0979		

NaC₃H₅O₃, Lactate [JAB] (514); (378, 463)**

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0022	4	1.0173	8	1.0377
2	1.0072	6	1.0275	10	1.0478

NaC₃H₅O₄, Glycerate [JAB] (378)

%	1	2	3	4	5	6
d_4^{20}	1.0041	1.0102	1.0165	1.0229	1.0295	1.0363

NaC₄H₅O₅, Acid malate [JAB] (376); (463)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0038	12	1.0670	24	1.1414	45	1.2854
2	1.0094	14	1.0790	26	1.1544	50	1.3224
4	1.0207	16	1.0911	28	1.1676	55	1.3605
6	1.0321	18	1.1034	30	1.1809	60	1.3996
8	1.0436	20	1.1159	35	1.2147		
10	1.0552	22	1.1286	40	1.2495		

NaC₄H₅O₆, Acid tartrate [JAB] (515); (432)*; (451, 463, 571)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0061	3	1.0170	5	1.0280	7	1.0391
2	1.0115	4	1.0225	6	1.0335		

NaC₄H₇O₂, n-Butyrate [JAB] (378, 449, 463); (484, 514)**

%	1	2	4	6	8	10
d_4^{20}	1.0018	1.0055	1.0130	1.0207	1.0286	1.0367

NaC₄H₇O₂, Isobutyrate [JAB] (514); (463)**

%	1	2	4	6	8	10
d_4^{25}	1.0009	1.0046	1.0121	1.0195	1.0268	1.0341

NaC₅H₉O₂, Isovalerate [JAB] (514)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0003	4	1.0100	8	1.0229	12	1.0358
2	1.0035	6	1.0164	10	1.0293		

NaC₆H₇O₇, Dihydrogen citrate [JAB] with 19.20%, $d_4^{18} = 1.1063$; with 5.35%, $d_4^{20} = 1.0205$ (463, 515)**

NaC₆H₁₁O₂, Isocaproate [JAB] (514)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	0.9999	4	1.0081	8	1.0191	12	1.0299
2	1.0026	6	1.0136	10	1.0245	14	1.0352

NaC₇H₅O₂, Benzoate [JAB] (376, 514)**

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0012	4	1.0135	8	1.0301	12	1.0469
2	1.0053	6	1.0218	10	1.0385	14	1.0554

NaC₇H₅O₃, Hydroxybenzoates [JAB] (376, 514)**

%	d_4^{25}			%	d_4^{25}		
	<i>o</i> -(514)	<i>m</i> -	<i>p</i> -		<i>o</i> -(514)	<i>m</i> -	<i>p</i> -
1	1.0013	1.0015	1.0015	10	1.0396	1.0432	1.0432
2	1.0055	1.0060	1.0060	12	1.0483	1.0528	1.0528
4	1.0139	1.0151	1.0151	14	1.0570	1.0626	1.0626
6	1.0224	1.0243	1.0243	16	1.0658	1.0724	1.0724
8	1.0310	1.0337	1.0337				

NaC₈H₇O₂, Toluates [JAB] (376)

%	d_4^{25}			%	d_4^{25}		
	<i>o</i> -	<i>m</i> -	<i>p</i> -		<i>m</i> -	<i>p</i> -	
1	1.0007	1.0007	1.0006	10	1.0342	1.0334	
2	1.0043	1.0043	1.0041	12	1.0418	1.0408	
4	1.0116	1.0116	1.0113	14	1.0495	1.0483	
6		1.0190	1.0186	16	1.0573	1.0558	
8		1.0266	1.0260				

NaC₈H₇O₂, Phenylacetate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0007	6	1.0188	10	1.0338	14	1.0490
2	1.0043	8	1.0262	12	1.0414	16	1.0566
4	1.0115						

NaC₈H₇O₃, Phenylglycolate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0011	6	1.0216	10	1.0382	14	1.0550
2	1.0052	8	1.0299	12	1.0466	16	1.0635
4	1.0134						

NaC₈H₇O₃, Anisate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0008	3	1.0084	5	1.0162	7	1.0242
2	1.0046	4	1.0123	6	1.0202	8	1.0282

NaC₈H₇O₃, Phenoxyacetate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0009	6	1.0202	10	1.0359	14	1.0518
2	1.0047	8	1.0280	12	1.0438	16	1.0600
4	1.0124						

NaC₉H₇O₂, Cinnamate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0006	3	1.0076	5	1.0147	7	1.0219
2	1.0041	4	1.0112	6	1.0183	8	1.0256

NaC₉H₉O₂, Hydrocinnamate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0002	6	1.0161	10	1.0290	14	1.0422
2	1.0034	8	1.0225	12	1.0356	16	1.0488
4	1.0097						

NaC₁₆H₃₁O₂, Palmitate [JAB] (134)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	0.9652	8	0.9644	16	0.9637	24	0.9629
2	0.9651	10	0.9642	18	0.9635	26	0.9627
4	0.9649	12	0.9640	20	0.9633	28	0.9626
6	0.9647	14	0.9638	22	0.9631	30	0.9624

NaC₁₈H₃₅O₂, Stearate [JAB] (134)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	0.965	6	0.963	10	0.962	14	0.961
2	0.964	8	0.962	12	0.961	16	0.960
4	0.964						

Na₂C₃H₂O₄, Malonate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0044	3	1.0191	5	1.0341	7	1.0495
2	1.0117	4	1.0266	6	1.0417		

Na₂C₄H₂O₄, Fumarate [JAB] (376); (329)**

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0035	3	1.0166	5	1.0299	7	1.0434
2	1.0100	4	1.0232	6	1.0366		

Na₂C₄H₂O₄, Maleate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0038	3	1.0174	5	1.0312	7	1.0453
2	1.0106	4	1.0243	6	1.0382	8	1.0524

Na₂C₄H₄O₄, Succinate [JAB] (376, 377, 463); (329)**

%	d_4^{20}	d_4^{25}	%	d_4^{20}
1	1.0048	1.0036	12	1.0805
2	1.0114	1.0102	14	1.0951
4	1.0247	1.0235	16	1.1100
6	1.0382	1.0368	18	1.1252
8	1.0520	1.0503	20	1.1406
10	1.0661			

Na₂C₄H₄O₄, Isosuccinate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0039	3	1.0176	5	1.0313	7	1.0451
2	1.0107	4	1.0245	6	1.0382	8	1.0521

Na₂C₄H₄O₅, Malate [JAB] (376); (444, 463, 546)**

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0038	3	1.0176	5	1.0317	7	1.0462
2	1.0106	4	1.0246	6	1.0389	8	1.0536

Na₂C₄H₄O₆, Tartrate [JAB] (376, 499, 500); (451)*; (210, 221, 223, 329, 330, 432, 463, 571)**

%	d_4^{20}	d_4^{25}	%	d_4^{20}
1	1.0052	1.0040	16	1.1156
2	1.0123	1.0110	18	1.1313
4	1.0266	1.0251	20	1.1471
6	1.0410	1.0393	22	1.1633
8	1.0555	1.0537	24	1.1797
10	1.0702	1.0683	26	1.1963
12	1.0851		28	1.2132
14	1.1002			

Na₂C₅H₄O₄, Citraconate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0033	3	1.0159	5	1.0286	7	1.0414
2	1.0096	4	1.0223	6	1.0350	8	1.0479

Na₂C₅H₄O₄, Itaconate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0032	3	1.0159	5	1.0288	7	1.0419
2	1.0095	4	1.0223	6	1.0353	8	1.0485

Na₂C₅H₄O₄, Mesaconate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0031	3	1.0152	5	1.0274	7	1.0397
2	1.0091	4	1.0213	6	1.0335	8	1.0460

Na₂C₅H₆O₄, Pyrotartrate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0029	3	1.0147	5	1.0266	7	1.0387
2	1.0088	4	1.0206	6	1.0326	8	1.0448

Na₂C₆H₆O₇, Hydrogen citrate [JAB]; 20.77 %, $d_4^{18} = 1.1372$ (515)

Na₂C₈H₄O₄, Phthalates [JAB] (376)

%	d_4^{25}			%	d_4^{25}		
	o-	m-	p-		o-	m-	p-
1	1.0031	1.0027	1.0024	6	1.0334	1.0313	1.0299
2	1.0092	1.0083	1.0078	8	1.0456	1.0431	
4	1.0213	1.0197	1.0187	10	1.0579	1.0551	

Na₂C₆H₈O₄, Adipate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0024	4	1.0185	6	1.0293	8	1.0403
2	1.0078	5	1.0239	7	1.0348	9	1.0458
3	1.0131						

Na₂C₈H₁₂O₄, Suberate [JAB] (376)

%	1	2	3	4	5
d_4^{25}	1.0017	1.0064	1.0112	1.0160	1.0208

Na₂C₉H₁₄O₄, Azelate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0013	4	1.0138	8	1.0306	12	1.0473
2	1.0055	6	1.0222	10	1.0389		

Na₂C₆H₅O₇, Citrate [JAB] (376); (463, 515)**

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0047	3	1.0201	5	1.0355	7	1.0510
2	1.0124	4	1.0278	6	1.0432	8	1.0589

Na₄C₁₁H₂O₁₀, Benzenepentacarboxylate [JAB] (457)

	1 %	2 %		1 %	2 %		1 %	2 %
d_4^{20}	1.0078	1.0158	d_4^{25}	1.0046	1.0121	d_4^{50}	0.9953	1.0024
d_4^{10}	1.0074	1.0152	d_4^{30}	1.0031	1.0106			
d_4^{20}	1.0058	1.0134	d_4^{40}	0.9995	1.0068			

Na₅C₁₁HO₁₀, Benzenepentacarboxylate [JAB] (457)

	1 %	2 %		1 %	2 %		1 %	2 %
d_4^{20}	1.0083	1.0169	d_4^{25}	1.0051	1.0133	d_4^{50}	0.9958	1.0038
d_4^{10}	1.0079	1.0163	d_4^{30}	1.0036	1.0118			
d_4^{20}	1.0063	1.0145	d_4^{40}	1.0000	1.0081			

NaC₂Cl₃O₂, Trichloroacetate [JAB] (377, 378, 463)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0039	6	1.0331	10	1.0578	14	1.0837
2	1.0096	8	1.0453	12	1.0706	16	1.0971
4	1.0212						

NaC₂H₂ClO₂, Chloroacetate [JAB] (377, 378, 463, 586)**

%	0.1	0.2	0.4	0.6	0.8	1.0
d_4^{18}	0.999 206	0.999 790	1.000 958	1.002 126	1.003 296	1.004 466
%	1.0	2	4	6	8	10
d_4^{20}	1.0040	1.0099	1.0217	1.0335	1.0454	1.0573
						1.0693

NaC₂HCl₂O₂, Dichloroacetate [JAB] (377, 378, 463)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.004	4	1.022	8	1.046	12	1.070
2	1.010	6	1.034	10	1.058	14	1.083

NaC₄H₄Cl₃O₂, Trichlorobutyrate [JAB] (378)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0033	3	1.0135	5	1.0238	7	1.0342
2	1.0084	4	1.0186	6	1.0290	8	1.0395

NaC₇H₄ClO₂, m-Chlorobenzoate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0015	6	1.0240	10	1.0426	14	1.0619
2	1.0059	8	1.0332	12	1.0522	16	1.0718
4	1.0149						

NaC₇H₄BrO₂, Bromobenzoates [JAB] (376)

%	d_4^{25}		%	d_4^{25}	
	m-	p-		m-	p-
1	1.0025	1.0023	6	1.0301	1.0298
2	1.0079	1.0077	8	1.0415	1.0413
4	1.0189	1.0186	10	1.0531	1.0530

NaC₂H₅SO₄, Ethyl sulfate [JAB] (155)

%	$d_4^{12.4}$	%	$d_4^{13.5}$	%	d_4^{14}
32.97	1.1699	39.89	1.2380	32.09	1.1689

NaC₂H₅SO₄, Hydroxyethylsulfonate [JAB]; with 3.70 %, d_4^{25} = 1.0171 (529)

NaC₆H₅SO₃, Benzenesulfonate [JAB]; 4.50 %, d_4^{25} = 1.0164 (529)

Na₂CH₂S₂O₆, Methanedisulfonate [JAB]; 2.75 %, d_4^{25} = 1.0161 (529)

NaC₇H₄NO₄, Nitrobenzoates [JAB] (376, 514)**

%	d_4^{25}			%	d_4^{25}		
	o-	m-(514)	p-		o-	m-(514)	p-
1	1.0017	1.0015	1.0018	10	1.0450	1.0427	1.0441
2	1.0063	1.0060	1.0065	12	1.0550	1.0522	
4	1.0157	1.0151	1.0159	14	1.0651	1.0617	
6	1.0253	1.0242	1.0253	16	1.0754	1.0713	
8	1.0351	1.0334	1.0347	18	1.0858	1.0810	

NaC₈H₄NO₂, m-Cyanobenzoate [JAB] (376)

%	d_4^{25}	%	d_4^{25}	%	d_4^{25}	%	d_4^{25}
1	1.0011	3	1.0092	5	1.0176	7	1.0260
2	1.0051	4	1.0134	6	1.0218	8	1.0302

NaCNS [JAB] (291); (155)* [LJG]**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0038	10	1.0520	20	1.1081	30	1.1677
2	1.0090	12	1.0630	22	1.1197	35	1.1960
4	1.0196	14	1.0741	24	1.1314	40	1.2280
6	1.0303	16	1.0853	26	1.1433	45	1.2650
8	1.0411	18	1.0966	28	1.1554		

Na₂SiO₃ [JAB] (288); (345, 577, 602) [LJG]**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0094	8	1.0884	16	1.1866	24	1.2926
2	1.0203	10	1.1122	18	1.2123	26	1.3204
4	1.0425	12	1.1365	20	1.2385		
6	1.0652	14	1.1613	22	1.2653		

Na₂O.xSiO₂ [JAB] (578) [LJG]; values of d_4^{20}

x	1 %	2 %	4 %	6 %	8 %	10 %
3.90	1.006	1.014	1.030	1.046	1.063	1.080
3.36	1.006	1.014	1.030	1.047	1.065	1.083
2.40	1.007	1.016	1.034	1.052	1.071	1.090
2.06	1.007	1.016	1.035	1.054	1.073	1.093
1.69	1.007	1.017	1.036	1.056	1.077	1.098

x	12 %	14 %	16 %	18 %	20 %	22 %
3.90	1.098	1.116	1.134	1.153	1.172	1.191
3.36	1.101	1.120	1.139	1.159	1.179	1.200
2.40	1.110	1.130	1.151			
2.06	1.113	1.134	1.156	1.178	1.200	1.223
1.69	1.119	1.141	1.163	1.186	1.210	1.234

x	24 %	26 %	28 %	30 %	32 %	34 %
3.90	1.211	1.232	1.253	1.275	1.298	
3.36	1.222	1.244	1.267	1.290	1.314	1.339
2.44			1.285	1.309	1.334	1.360
2.06	1.247	1.271	1.296	1.321	1.346	1.371
1.69	1.259	1.284	1.310	1.337	1.365	1.394

Na₂O.xSiO₂—(Continued)

<i>x</i>	36 %	38 %	40 %	45 %	50 %	55 %
3.36	1.365	1.393				
2.44	1.387	1.415	1.445			
2.06	1.397	1.423	1.450	1.520	1.594	1.673
1.69	1.424	1.456				

Na₂SnO₃ [JAB] (602); (460) [LJG]**

%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰
1	1.006	6	1.051	12	1.107	18	1.166
2	1.015	8	1.069	14	1.126	20	1.187
4	1.033	10	1.088	16	1.146		

NaHgCl₃ [GS]; *d*₄¹⁶ = 1.09514 with 11.0736 %; = 1.13296 with 14.9370 % (550)

Na₂Cd(SO₄)₂ [GS]; *d*₄¹⁸ = 1.0911 with 9.56 %; = 1.1145 with 11.80 % (550)

NaCu(CN)₂ [WCS]; *d*₄²⁰ = 1.0040 with 1 %; = 1.0098 with 2 %; = 1.0212 with 4 % (602)

NaMnO₄ [LJG]; with 3.55 %, *d*₄²⁵ = 1.0221 (529)

Na₂MoO₄ [JAB] (602) [LJG]

%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵
1	1.0078	6	1.0526	12	1.1102	18	1.1724
2	1.0165	8	1.0713	14	1.1304	20	1.1943
4	1.0343	10	1.0905	16	1.1511	22	1.2168

Na₂CrO₄ [JAB] (288); (463, 566) [LJG]**

%	<i>d</i> ₄ ¹⁸	%	<i>d</i> ₄ ¹⁸	%	<i>d</i> ₄ ¹⁸	%	<i>d</i> ₄ ¹⁸
1	1.0074	8	1.0718	16	1.1518	24	1.2383
2	1.0163	10	1.0912	18	1.1728	26	1.2611
4	1.0344	12	1.1110	20	1.1942		
6	1.0529	14	1.1312	22	1.2160		

Na₂Cr₂O₇ [JAB] (575); (463) [LJG]**

%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵
1	1.006	10	1.070	20	1.140	30	1.207
2	1.013	12	1.084	22	1.153	35	1.244
4	1.027	14	1.098	24	1.166	40	1.279
6	1.041	16	1.112	26	1.179	45	1.312
8	1.056	18	1.126	28	1.193	50	1.342

Na₂WO₄† [LJG] (207)

%	<i>d</i> ₄ ¹⁵ (602)*	<i>d</i> ₄ ²⁰ (481)*	%	<i>d</i> ₄ ¹⁵ (602)*	<i>d</i> ₄ ²⁰ (481)*	%	<i>d</i> ₄ ¹⁵ (602)*	<i>d</i> ₄ ²⁰ (481)*
1	1.0082	1.0074	14	1.1376	1.1372	28	1.3182	1.3146
2	1.0174	1.0166	16	1.1606	1.1598	30	1.3473	1.3444
4	1.0359	1.0354	18	1.1846	1.1833	32	1.3769	1.3756
6	1.0548	1.0546	20	1.2096	1.2076	34	1.4069	1.4084
8	1.0743	1.0742	22	1.2355	1.2328	36	1.4372	1.4428
10	1.0945	1.0944	24	1.2622	1.2590	38		1.4786
12	1.1156	1.1154	26	1.2898	1.2862	40		1.5156

† Isotherms are inconsistent. Six-point figures indicate only that uncertainty which is due to interpolation.

2Na₂O.P₂O₅.24WO₃ [LJG] (65)

%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰
1	1.007	10	1.091	20	1.198	30	1.336	55	1.871
2	1.016	12	1.110	22	1.223	35	1.418	60	2.033
4	1.034	14	1.130	24	1.249	40	1.510		
6	1.053	16	1.152	26	1.277	45	1.614		
8	1.072	18	1.175	28	1.306	50	1.733		

NaVO₃ [LJG] (602)

%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰
1	1.0060	4	1.0302	8	1.0640	12	1.0991
2	1.0140	6	1.0469	10	1.0814		

NaBO₂ [JAB] (602) [LJG]

%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰	%	<i>d</i> ₄ ²⁰
1	1.0089	4	1.0417	8	1.0866	12	1.1327
2	1.0198	6	1.0640	10	1.1095		

Na₂B₄O₇ [JAB] (225); (28, 205, 206, 241, 242) [LJG];** *d*₄¹⁵ = 1.0084 with 1 %; = 1.0179 with 2 %; = 1.0274 with 3 %

Na₂Mg(SO₄)₂ [GS]; *d*₄¹⁶ = 1.0665 with 7 %; = 1.0766 with 8 %; = 1.0867 with 9 % (550)

KOH [BTB] (492); (12, 98, 106, 248, 279, 290, 328, 342, 344, 378, 387, 432, 449, 451, 463, 519, 529, 555, 666), α(211)**

%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵
1	1.0083	10	1.0918	20	1.1884	30	1.2905	40	1.3991
2	1.0175	11	1.1013	21	1.1984	31	1.3010	41	1.4103
3	1.0267	12	1.1108	22	1.2083	32	1.3117	42	1.4215
4	1.0359	13	1.1203	23	1.2184	33	1.3224	43	1.4329
5	1.0452	14	1.1299	24	1.2285	34	1.3331	44	1.4443
6	1.0544	15	1.1396	25	1.2387	35	1.3440	45	1.4558
7	1.0637	16	1.1493	26	1.2489	36	1.3549	46	1.4673
8	1.0730	17	1.1590	27	1.2592	37	1.3659	47	1.4790
9	1.0824	18	1.1688	28	1.2695	38	1.3769	48	1.4907
		19	1.1786	29	1.2800	39	1.3879	49	1.5025

%	50	51	51.7†	52
<i>d</i> ₄ ¹⁵	1.5143	1.5262	1.5355	1.5382

† Satd. soln. (196).

KF [JAB] (287, 548); (36, 45, 101, 190, 225, 246, 342)**

%	<i>d</i> ₄ ¹⁸	%	<i>d</i> ₄ ¹⁸	%	<i>d</i> ₄ ¹⁸	%	<i>d</i> ₄ ¹⁸
1	1.0072	8	1.0693	16	1.1448	24	1.2260
2	1.0159	10	1.0877	18	1.1646	26	1.2471
4	1.0334	12	1.1064	20	1.1847		
6	1.0512	14	1.1254	22	1.2052		

KCl, see p. 87

KClO₃ [JAB] (268, 548), α (206); (287, 511)*; (84, 106, 342, 343, 344, 360, 361, 449, 509, 510, 529, 561, 583), α (271) [LJG]**

°C	1 %	2 %	3 %	4 %	5 %	6 %
0	1.0061	1.0124	1.0189	1.0256		
10	1.0059	1.0122	1.0187	1.0254		
18	1.0049	1.0113	1.0178	1.0245	1.0312	1.0380
20	1.0045	1.0109	1.0174	1.0241		
25	1.0034	1.0099	1.0165	1.0233		
30	1.0020	1.0085	1.0151	1.0218		
40	0.9986	1.0051	1.0116	1.0183		
50	0.9944	1.0008	1.0073	1.0140		
60	0.9895	0.9959	1.0024	1.0091		
70	0.9841	0.9905	0.9970	1.0036		
80	0.9781	0.9845	0.9910	0.9977		
90	0.9716	0.9780	0.9845	0.9912		
100	0.9646	0.9709	0.9774	0.9840		

%	<i>d</i> ₄ ¹⁵ (46)	%	<i>d</i> ₄ ¹⁵ (46)	%	<i>d</i> ₄ ¹⁵ (46)	%	<i>d</i> ₄ ¹⁵ (46)
1	1.0056	8	1.0518	16	1.1063	24	1.1657
2	1.0122	10	1.0651	18	1.1206		
4	1.0253	12	1.0786	20	1.1352		
6†	1.0385	14	1.0923	22	1.1502		

† Solutions above ca. 6 % are supersaturated.

KClO₄ [LJG] (602); (99)**

%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵	%	<i>d</i> ₄ ¹⁵
0.1	0.9997	0.6	1.0029	1.2	1.0067	1.8	1.0105
0.2	1.0004	0.8	1.0041	1.4	1.0079		
0.4	1.0016	1.0	1.0054	1.6	1.0092		

KCl [JAB] (24, 26, 150), α (364, 367, 370)**; (20, 21, 25, 58, 83, 84, 110, 250, 256), α (219, 256)*; (1, 2, 18, 22, 27, 36, 37, 38, 45, 101, 105, 106, 125, 144, 151, 190, 199, 201, 206, 215, 219, 221, 223, 224, 225, 228, 246, 261, 269, 277, 278, 297, 312, 313, 314, 344, 347, 360, 361, 378, 385, 418, 425, 447, 448, 449, 451, 452, 459, 487, 505, 511, 517, 519, 520, 529, 533, 547, 573, 583, 589, 592, 618, 629, 632, 633, 660), α (37, 38, 151, 159, 211, 271, 448, 606, 609)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00661	1.00627	1.00463	1.00342	1.00198	0.99847	0.99426	0.9894	0.9780	0.9646
2	1.01335	1.01280	1.01103	1.00977	1.00829	1.00471	1.00046	0.9956	0.9842	0.9708
4	1.02690	1.02595	1.02391	1.02255	1.02099	1.01727	1.01294	1.0080	0.9966	0.9834
6	1.04055	1.03920	1.03690	1.03544	1.03380	1.02995	1.02554	1.0206	1.0092	0.9960
8	1.05431	1.05257	1.05003	1.04847	1.04675	1.04278	1.03829	1.0333	1.0219	1.0088
10	1.06820	1.06609	1.06332	1.06167	1.05987	1.05578	1.05122	1.0461	1.0347	1.0218
12	1.08222	1.07978	1.07679	1.07506	1.07318	1.06897	1.06435	1.0592	1.0478	1.0350
14	1.09638	1.09366	1.09046	1.08865	1.08669	1.08237	1.07770	1.0725	1.0611	1.0483
16	1.11068	1.10775	1.10434	1.10245	1.10041	1.09600	1.09128	1.0861	1.0746	1.0619
18	1.12513	1.12207	1.11845	1.11647	1.11435	1.10987	1.10510	1.0998	1.0884	1.0757
20	1.13973	1.13663	1.13280	1.13072	1.12852	1.12399	1.11917	1.1138	1.1024	1.0897
22	1.15449	1.15144	1.14740	1.14521	1.14294	1.13836	1.13349	1.1281	1.1166	1.1040
24			1.16226	1.15995	1.15762	1.15299	1.14807	1.1425	1.1311	1.1185
26				1.17495	1.17254	1.16788	1.16291	1.1573	1.1458	1.1333
28						1.18304	1.17802	1.1723	1.1609	1.1483

%	$d_4^{20.004}$	%	$d_4^{20.004}$	°C	3.79%	7.45%	13.62%
(373)		(373)		(588)			
0.01	0.99829644	0.05	0.99855557	110	0.9733	0.9978	1.0388
0.02	0.99836135	0.06	0.99862004	120	0.9663	0.9899	1.0313
0.03	0.99842620	0.07	0.99868435	130	0.9583	0.9827	1.0238
0.04	0.99849095			140	0.9502	0.9745	1.0159

KBr [JAB] (25, 26), α (367)**; (83, 84, 110, 287, 548), α (203, 375, 609)*; (1, 12, 36, 45, 106, 144, 190, 201, 206, 221, 225, 228, 246, 261, 277, 307, 312, 313, 319, 322, 344, 360, 361, 378, 447, 451, 459, 519, 530, 547, 573, 589, 596, 618), α (151)

°C	1%	2%	4%	6%	8%	10%
0	1.00732	1.01484	1.03016	1.04584	1.06189	1.07833
10	1.00704	1.01442	1.02945	1.04483	1.06058	1.07672
20	1.00542	1.01268	1.02747	1.04261	1.05811	1.07399
25	1.00421	1.01143	1.02612	1.04116	1.05656	1.07235
30	1.00277	1.00995	1.02456	1.03952	1.05484	1.07055
40	0.99928	1.00639	1.02087	1.03570	1.05090	1.06649
50	0.99505	1.00211	1.01648	1.03120	1.04629	1.06176
60	0.9902	0.9972	1.0115	1.0261	1.0411	1.0565
80	0.9787	0.9857	0.9999	1.0145	1.0294	1.0446
100	0.9653	0.9722	0.9863	1.0009	1.0157	1.0309

°C	12%	14%	16%	18%	20%	22%
0	1.09517	1.11243	1.13012	1.14826	1.16687	1.18597
10	1.09327	1.11025	1.12768	1.14558	1.16396	1.18285
20	1.09028	1.10701	1.12420	1.14187	1.16005	1.17876
25	1.08855	1.10518	1.12227	1.13985	1.15794	1.17655
30	1.08667	1.10323	1.12025	1.13775	1.15575	1.17427
40	1.08249	1.09892	1.11580	1.13314	1.15097	1.16931
50	1.07763	1.09392	1.11065	1.12785	1.14554	1.16374
60	1.0724	1.0886	1.1053	1.1224	1.1401	1.1582
80	1.0603	1.0765	1.0930	1.1100	1.1276	1.1456
100	1.0466	1.0627	1.0792	1.0962	1.1136	1.1316

0°C	24%	26%	28%	30%	35%	40%
0	1.20559	1.22576				
10	1.20227	1.22225				
20	1.19802	1.21784	1.23825	1.25927	1.31467	1.37457
25	1.19570	1.21541	1.23570	1.25660	1.31173	1.37149
30	1.19333	1.21294	1.23313	1.25392	1.30887	1.36851
40	1.18819	1.20764	1.22769	1.24838	1.30306	1.36247
50	1.18248	1.20180	1.22173	1.24230	1.29674	1.35593
60	1.1769	1.1961	1.2160	1.2365	1.2907	1.3496
80	1.1641	1.1832	1.2030	1.2233	1.2771	1.3356
100	1.1501	1.1691	1.1888	1.2090	1.2627	1.3211

KBrO₃ [JAB] (84, 509, 510), α (206)**; (360, 361) [LJG]

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.0074	1.0072	1.00562	1.0044	1.0030	0.9996
2	1.0150	1.0148	1.01308	1.0119	1.0104	1.0070
3	1.0227	1.0224	1.02061	1.0194	1.0179	1.0145
4	1.0304	1.0301	1.02821	1.0270	1.0255	1.0221
5	1.0383	1.0379	1.03587	1.0346	1.0332	1.0297

%	50°C	60°C	70°C	80°C	90°C	100°C
1	0.9954	0.9905	0.9851	0.9792	0.9728	0.9658
2	1.0028	0.9979	0.9925	0.9866	0.9803	0.9733
3	1.0103	1.0054	1.0000	0.9941	0.9878	0.9808
4	1.0178	1.0129	1.0075	1.0017	0.9954	0.9885
5	1.0254	1.0205	1.0151	1.0094	1.0031	0.9962

KI, see p. 88

KIO₃ [JAB] (548), α (206)**; (84, 287)*; (250, 360, 361, 529, 583) [LJG]

°C	1%	2%	3%	°C	1%	2%	3%
0	1.0082	1.0167	1.0254	50	0.9969	1.0058	1.0148
10	1.0081	1.0166	1.0253	60	0.9921	1.0011	1.0102
18†	1.00711	1.01572	1.02446	70	0.9868	0.9958	1.0050
20	1.0068	1.0155	1.0243	80	0.9808	0.9899	0.9992
25	1.0057	1.0144	1.0232	90	0.9744	0.9835	0.9928
30	1.0043	1.0131	1.0220	100	0.9674	0.9764	0.9856
40	1.0010	1.0098	1.0188				

† $d_4^{18} = 1.03334$ with 4%; = 1.04236 with 5%; = 1.05153 with 6%.

K₂SO₃ [JAB] (602)**; (519) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0073	8	1.0667	16	1.1402	24	1.2197
2	1.0155	10	1.0844	18	1.1596	26	1.2404
4	1.0322	12	1.1026	20	1.1793		
6	1.0493	14	1.1212	22	1.1993		

K₂SO₄, see p. 88

K₂S₂O₆ [JAB] (276)**; (529) [LJG]

%	1	2	3	4	5	6
d_4^{20}	1.00499	1.01179	1.01863	1.02551	1.03244	1.03943

K₂S₂O₇ [JAB] (602) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0067	6	1.0450	12	1.0926	18	1.1421
2	1.0143	8	1.0606	14	1.1089	20	1.1589
4	1.0296	10	1.0765	16	1.1254	22	1.1759

KI [JAB] (26), α (368)**; (25, 83, 84, 110, 250, 287), α (203)*; (1, 2, 12, 27, 36, 45, 57, 101, 106, 190, 201, 206, 221, 223, 224, 225, 228, 246, 261, 269, 277, 307, 312, 315, 319, 322, 342, 344, 360, 361, 378, 447, 517, 519, 530, 533, 547, 550, 573, 583, 589, 596, 618, 660), α (151, 587)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00742	1.00715	1.00554	1.00434	1.00290	0.99940	0.98522	0.9903	0.9788	0.9653
2	1.01508	1.01468	1.01297	1.01172	1.01024	1.00667	1.00236	0.9975	0.9859	0.9723
4	1.03070	1.03004	1.02811	1.02677	1.02521	1.02151	1.01705	1.0121	1.0003	0.9867
6	1.04675	1.04582	1.04367	1.04223	1.04059	1.03674	1.03216	1.0271	1.0152	1.0014
8	1.06324	1.06204	1.05966	1.05812	1.05640	1.05241	1.04771	1.0425	1.0305	1.0166
10	1.08019	1.07872	1.07610	1.07446	1.07266	1.06853	1.06371	1.0584	1.0462	1.0321
12	1.09762	1.09588	1.09302	1.09128	1.08939	1.08512	1.08018	1.0748	1.0623	1.0482
14	1.11555	1.11354	1.11044	1.10860	1.10662	1.10220	1.09714	1.0916	1.0790	1.0647
16	1.13401	1.13173	1.12839	1.12645	1.12438	1.11980	1.11461	1.1089	1.0961	1.0818
18	1.15303	1.15048	1.14689	1.14485	1.14269	1.13795	1.13262	1.1268	1.1138	1.0993
20	1.17263	1.16981	1.16597	1.16383	1.16158	1.15668	1.15120	1.1453	1.1321	1.1174
22	1.19284	1.18975	1.18566	1.18342	1.18108	1.17601	1.17038	1.1643	1.1509	1.1361
24	1.21369	1.21033	1.20599	1.20365	1.20121	1.19597	1.19019	1.1840	1.1704	1.1554
26	1.23521	1.23158	1.22700	1.22455	1.22201	1.21660	1.21066	1.2044	1.1905	1.1753
28	1.25743	1.25353	1.24872	1.24615	1.24352	1.23794	1.23183	1.2254	1.2113	1.1959
30	1.28037	1.27622	1.27118	1.26849	1.26577	1.26002	1.25373	1.2472	1.2329	1.2173
35	1.34120	1.33641	1.33082	1.32787	1.32490	1.31867	1.31191	1.3050	1.2901	1.2740
40	1.40745	1.40203	1.39590	1.39269	1.38945	1.38272	1.37548	1.3682	1.3527	1.3361
45	1.47992	1.47387	1.46721	1.46374	1.46022	1.45297	1.44524	1.4377	1.4215	1.4044
50	1.55961	1.55294	1.54575	1.54203	1.53822	1.53042	1.52222	1.5143	1.4975	1.4799
55	1.64772	1.64044	1.63272	1.62875	1.62464	1.61627	1.60756	1.5993	1.5818	1.5637

K₂SO₄ [JAB] (250, 603), α (203, 370)**; (20, 21), α (219)*; (1, 11, 22, 36, 101, 106, 144, 147, 151, 155, 184, 190, 206, 219, 221, 223, 224, 225, 246, 261, 297, 312, 342, 344, 360, 361, 374, 378, 385, 405, 415, 422, 425, 432, 449, 451, 505, 517, 519, 529, 573, 585, 598, 615, 618, 629), α (151)

°C	1%	2%	4%	6%	8%	10%
0	1.0084	1.0170	1.0342	1.0516		
10	1.0080	1.0163	1.0331	1.0501	1.0673	
20	1.0063	1.0145	1.0310	1.0477	1.0646	1.0817
25	1.0051	1.0132	1.0296	1.0462	1.0630	1.0800
30	1.0037	1.0117	1.0280	1.0445	1.0612	1.0781
40	1.0001	1.0081	1.0242	1.0406	1.0572	1.0740
50	0.9959	1.0038	1.0198	1.0361	1.0526	1.0693
60	0.9911	0.9989	1.0148	1.0310	1.0475	1.0642
80	0.9796	0.9874	1.0033	1.0195	1.0360	1.0527
100	0.9662	0.9741	0.9901	1.0063	1.0227	1.0393

K₂S₂O₈ [JAB] (602) [LJG]; $d_4^{15} = 1.0057$ with 1%; = 1.0123 with 2%

K₂S₃O₆ [JAB] (276) [LJG]

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.00471	4	1.02443	8	1.05144	12	1.07950
2	1.01124	6	1.03782	10	1.06532		

K₂S₄O₆ [JAB] (276) [LJG]

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.00445	4	1.02340	8	1.04942	12	1.07648
2	1.01072	6	1.03629	10	1.06281		

K₂S₅O₆ [JAB] (276) [LJG]

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.00420	4	1.02236	8	1.04730	12	1.07337
2	1.01021	6	1.03471	10	1.06017	14	1.08694

KHS [JAB] (52) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0045	10	1.0583	20	1.1196	30	1.1829
2	1.0105	12	1.0704	22	1.1321	35	1.2152
4	1.0224	14	1.0826	24	1.1447	40	1.2479
6	1.0343	16	1.0949	26	1.1574	45	1.2810
8	1.0463	18	1.1072	28	1.1701	50	1.3144

KHSO₄ [JAB] (225, 248, 451), α (203)**; (342, 405)*; (432)

°C	1%	2%	4%	6%	8%	10%
0	1.0073	1.0148	1.0299	1.0452	1.0607	1.0764
10	1.0068	1.0139	1.0284	1.0431	1.0581	1.0734
15	1.0061	1.0131	1.0273	1.0418	1.0566	1.0717
20	1.0051	1.0120	1.0260	1.0403	1.0549	1.0698
25	1.0039	1.0107	1.0245	1.0386	1.0530	1.0677
30	1.0024	1.0091	1.0228	1.0367	1.0509	1.0655
40	0.9987	1.0052	1.0185	1.0321	1.0461	1.0605

°C	12%	14%	16%	18%	20%	22%
0	1.0924	1.1086	1.1250			
10	1.0890	1.1048	1.1208			
15†	1.0871	1.1027	1.1185	1.1345	1.1508	1.1673
20	1.0850	1.1004	1.1161			
25	1.0827	1.0980	1.1136			
30	1.0804	1.0956	1.1110			
40	1.0752	1.0902	1.1055			

† $d_4^{15} = 1.1841$ with 24%; = 1.2012 with 26%.

KOH.KHS [JAB] (52) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0057	12	1.0863	24	1.1801	45	1.3630
2	1.0129	14	1.1014	26	1.1964	50	1.4106
4	1.0274	16	1.1167	28	1.2130	55	1.4598
6	1.0420	18	1.1323	30	1.2297		
8	1.0564	20	1.1481	35	1.2726		
10	1.0714	22	1.1640	40	1.3170		

KOH.3KHS [JAB] (52) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0047	10	1.0599	20	1.1224	30	1.1869
2	1.0108	12	1.0723	22	1.1351	35	1.2202
4	1.0230	14	1.0847	24	1.1479	40	1.2544
6	1.0353	16	1.0972	26	1.1608	45	1.2894
8	1.0476	18	1.1098	28	1.1738	50	1.3252

3KOH.KHS [JAB] (52) [LJG]

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0061	12	1.0894	24	1.1839	45	1.3635
2	1.0136	14	1.1049	26	1.2001	50	1.4107
4	1.0286	16	1.1205	28	1.2165	55	1.4603
6	1.0437	18	1.1362	30	1.2330		
8	1.0588	20	1.1520	35	1.2750		
10	1.0740	22	1.1679	40	1.3184		

K₂SeO₃ [JAB] (602); (463) [LJG]**

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.007	6	1.051	12	1.106	18	1.166
2	1.016	8	1.069	14	1.125	20	1.187
4	1.034	10	1.088	16	1.145		

K₂SeO₄ [JAB] (602, 614) [LJG]**

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0073	4	1.0324	8	1.0668	12	1.1026
2	1.0156	6	1.0494	10	1.0845	14	1.1212

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
36	1.3620	40	1.4140	44	1.4695	48	1.5283
38	1.3876	42	1.4413	46	1.4985	50	1.5590

KHSeO₃ [LJG]; with 5.57 %, $d_4^{20} = 1.0415$ (463)**K₂TeO₃ [JAB] (602) [LJG]**

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0075	6	1.0514	12	1.1085	18	1.1711
2	1.0160	8	1.0699	14	1.1287	20	1.1932
4	1.0334	10	1.0889	16	1.1496	22	1.2160

KN₃ [LJG] (74)

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.0059	1.0054	1.0037	1.0026	1.0012	0.9976
2	1.0118	1.0111	1.0093	1.0081	1.0067	1.0031
4	1.0237	1.0226	1.0206	1.0192	1.0177	1.0140
6	1.0358	1.0342	1.0319	1.0304	1.0289	1.0250
8	1.0480	1.0459	1.0434	1.0418	1.0402	1.0361
10	1.0603	1.0578	1.0550	1.0534	1.0516	1.0473
12	1.0727	1.0700	1.0669	1.0651	1.0632	1.0587
14	1.0853	1.0824	1.0790	1.0770	1.0750	1.0702
16	1.0982	1.0949	1.0913	1.0891	1.0869	1.0819
18	1.1113	1.1076	1.1036	1.1014	1.0990	1.0938
20	1.1245	1.1204	1.1161	1.1138	1.1113	1.1059
22	1.1378	1.1334	1.1288	1.1264	1.1238	1.1183
24	1.1512	1.1465	1.1417	1.1391	1.1365	1.1308
26	1.1647	1.1597	1.1547	1.1520	1.1493	1.1435
28	1.1783	1.1731	1.1678	1.1650	1.1622	1.1563
30	1.1919	1.1865	1.1809	1.1781	1.1752	1.1692
32	1.2055	1.1999	1.1941	1.1912	1.1883	1.1822
34	1.2191	1.2133	1.2074	1.2045	1.2015	1.1952

KNO₃ [JAB] (84, 250, 256, 448, 449, 451, 452), α (256, 370); (20), α (203, 211)*; (1, 36, 87, 101, 106, 144, 190, 206, 215, 219, 221, 223, 224, 225, 228, 246, 269, 271, 312, 342, 344, 360, 361, 385, 422, 519, 529, 533, 536, 573, 583, 592, 629, 660), α (151, 605)**

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C	60°C	80°C	100°C
1	1.00654	1.00615	1.00447	1.00324	1.00178	0.99825	0.99401	0.9890	0.9776	0.9641
2	1.01326	1.01262	1.01075	1.00946	1.00794	1.00430	0.99999	0.9949	0.9834	0.9699
4	1.02677	1.02566	1.02344	1.02203	1.02038	1.01652	1.01207	1.0068	0.9951	0.9816
6	1.04041	1.03887	1.03632	1.03479	1.03301	1.02892	1.02432	1.0189	1.0070	0.9935
8	1.05419	1.05226	1.04940	1.04775	1.04584	1.04152	1.03676	1.0313	1.0192	1.0056
10	1.06812	1.06584	1.06269	1.06093	1.05889	1.05434	1.04941	1.0439	1.0316	1.0179
12	1.08221	1.07963	1.07620	1.07433	1.07217	1.06740	1.06229	1.0567	1.0442	1.0304
14			1.08994	1.08796	1.08569	1.08072	1.07542	1.0698	1.0571	1.0432
16			1.10392	1.10183	1.09947	1.09432	1.08882	1.0831	1.0703	1.0562
18			1.11814	1.11595	1.11351	1.10821	1.10251	1.0967	1.0837	1.0695
20			1.13261	1.13033	1.12782	1.12240	1.11650	1.1106	1.0974	1.0831
22			1.14734	1.14497	1.14240	1.13691	1.13080	1.1247	1.1113	1.0969
24			1.16233	1.15988	1.15726	1.15175	1.14543	1.1391	1.1256	1.1110

KN₃—(Continued)

%	50°C	60°C	70°C	80°C	90°C	100°C
1	0.9934	0.9885	0.9831	0.9772	0.9708	0.9639
2	0.9987	0.9938	0.9884	0.9826	0.9762	0.9695
4	1.0094	1.0044	0.9991	0.9934	0.9872	0.9806
6	1.0203	1.0152	1.0099	1.0043	0.9982	0.9918
8	1.0313	1.0261	1.0209	1.0153	1.0093	1.0030
10	1.0424	1.0372	1.0319	1.0264	1.0205	1.0143
12	1.0536	1.0484	1.0430	1.0376	1.0318	1.0257
14	1.0651	1.0598	1.0543	1.0489	1.0433	1.0372
16	1.0767	1.0713	1.0658	1.0604	1.0548	1.0488
18	1.0885	1.0831	1.0775	1.0720	1.0664	1.0605
20	1.1006	1.0950	1.0893	1.0838	1.0782	1.0723
22	1.1128	1.1070	1.1012	1.0957	1.0901	1.0842
24	1.1251	1.1192	1.1133	1.1077	1.1020	1.0961
26	1.1376	1.1316	1.1256	1.1198	1.1141	1.1081
28	1.1503	1.1441	1.1379	1.1320	1.1262	1.1203
30	1.1630	1.1566	1.1503	1.1443	1.1384	1.1325
32	1.1758	1.1693	1.1629	1.1567	1.1507	1.1448
34	1.1886	1.1820	1.1755	1.1692	1.1630	1.1572

KNO₂ [JAB] (106, 468) [LJG]**

%	$d_4^{17.5}$	%	$d_4^{17.5}$	%	$d_4^{17.5}$	%	$d_4^{17.5}$
1	1.005	14	1.088	28	1.187	60	1.484
2	1.011	16	1.102	30	1.203	65	1.540
4	1.024	18	1.116	35	1.242	70	1.598
6	1.037	20	1.130	40	1.284	75	1.658
8	1.049	22	1.144	45	1.329		
10	1.062	24	1.158	50	1.378		
12	1.075	26	1.172	55	1.430		

KNO₃, v. infra**K₃PO₄ [LJG] (203,† 463)**

%	d_4^{20} (463)	%	d_4^{15} (203)
3.54	1.0345	17.98	1.1805

† For α , 0–30°C, 9.7 and 18 %, v. (203).

K₂HPO₃ [LJG]; with 3.96 %, $d_4^{20} = 1.0308$ (463)

KH₂PO₃ [LJG]; with 4.00 %, $d_4^{20} = 1.0238$ (463)

K₂HPO₄ [LJG]; with 8.23 %, $d_4^{15} = 1.0569$ (144); with 27.58 %, $d_4^{15} = 1.2633$ (203). For α at 0–40°C, 8, 15 and 28 %, v. (203)

KH₂PO₄, see p. 90

K₃AsO₄ [LJG]; with 4.27 %, $d_4^{20} = 1.0390$ (463)

KH₂AsO₄ [LJG]; with 4.50 %, $d_4^{20} = 1.0316$ (463)

KSbO₃ [JAB]; $d_4^{20} = 1.0067$ with 1 %; = 1.0152 with 2 % (602) [LJG]

K₄Sb₂O₇ [JAB]; $d_4^{20} = 1.0068$ with 1 %; = 1.0155 with 2 % (602) [LJG]

KH₂PO₄ [LJG] (342, 343); (203, 451)*; (463), α (203)**

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.0074	1.0070	1.0054	1.0042	1.0027	0.9992
2	1.0148	1.0142	1.0125	1.0112	1.0097	1.0061
4	1.0293	1.0284	1.0264	1.0251	1.0235	1.0198
6	1.0437	1.0425	1.0403	1.0388	1.0372	1.0334
8	1.0581	1.0567	1.0542	1.0527	1.0510	1.0471
10	1.0729	1.0711	1.0685	1.0669	1.0651	1.0611
12	1.0883	1.0863	1.0835	1.0818	1.0799	1.0758
14	1.1051	1.1028	1.0998	1.0981	1.0962	1.0919

K₂CO₃ [JAB] (342, 343), α (219); (219)*; (144, 261, 312, 328, 344, 509, 510, 548, 585, 632), α (206, 253, 254) [LJG]**

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.0094	1.0089	1.0072	1.0060	1.0045	1.0010
2	1.0189	1.0182	1.0163	1.0149	1.0134	1.0098
4	1.0381	1.0369	1.0345	1.0330	1.0314	1.0276
6	1.0574	1.0557	1.0529	1.0513	1.0496	1.0457
8	1.0768	1.0746	1.0715	1.0699	1.0681	1.0640
10	1.0963	1.0937	1.0904	1.0887	1.0868	1.0825
12	1.1160	1.1131	1.1096	1.1078	1.1058	1.1013
14	1.1359	1.1329	1.1291	1.1272	1.1251	1.1204
16	1.1562	1.1530	1.1490	1.1470	1.1448	1.1399
18	1.1768	1.1734	1.1692	1.1672	1.1649	1.1598
20	1.1977	1.1941	1.1898	1.1877	1.1853	1.1801
22	1.2189	1.2152	1.2107	1.2085	1.2061	1.2008
24	1.2405	1.2366	1.2320	1.2297	1.2272	1.2219
26	1.2624	1.2583	1.2536	1.2512	1.2487	1.2434
28	1.2846	1.2804	1.2756	1.2731	1.2705	1.2652
30	1.3071	1.3028	1.2979	1.2953	1.2926	1.2873
35	1.3646	1.3600	1.3548	1.3522	1.3494	1.3440
40	1.4244	1.4195	1.4141	1.4114	1.4086	1.4029
45	1.4867	1.4815	1.4759	1.4731	1.4703	1.4644
50	1.5517	1.5462	1.5404	1.5374	1.5347	1.5285

%	50°C	60°C	70°C	80°C	90°C	100°C
1	0.9968	0.9919	0.9864	0.9803	0.9739	0.9670
2	1.0055	1.0005	0.9950	0.9889	0.9825	0.9756
4	1.0231	1.0180	1.0124	1.0063	0.9999	0.9931
6	1.0410	1.0358	1.0301	1.0239	1.0176	1.0110
8	1.0592	1.0538	1.0480	1.0418	1.0355	1.0291
10	1.0776	1.0720	1.0662	1.0600	1.0538	1.0475
12	1.0963	1.0906	1.0847	1.0786	1.0725	1.0663
14	1.1154	1.1096	1.1036	1.0976	1.0916	1.0854
16	1.1349	1.1290	1.1230	1.1170	1.1111	1.1049
18	1.1547	1.1488	1.1428	1.1368	1.1309	1.1248
20	1.1749	1.1690	1.1630	1.1570	1.1512	1.1451
22	1.1955	1.1896	1.1836	1.1776	1.1719	1.1658
24	1.2165	1.2106	1.2046	1.1986	1.1930	1.1869
26	1.2379	1.2320	1.2260	1.2200	1.2144	1.2083
28	1.2596	1.2538	1.2478	1.2418	1.2361	1.2301
30	1.2816	1.2759	1.2700	1.2640	1.2582	1.2522
35	1.3383	1.3324	1.3266	1.3206	1.3148	1.3089
40	1.3972	1.3913	1.3855	1.3795	1.3737	1.3678
45	1.4587	1.4528	1.4468	1.4408	1.4349	1.4290
50	1.5228	1.5169	1.5109	1.5048	1.4988	1.4928

K₂C₂O₄, Oxalate [JAB] (632); (250)*; (144, 155, 208, 224, 329, 342, 343, 432, 451, 463)**

%	d_4^{18}	d_4^{25}	%	d_4^{18}	d_4^{25}	%	d_4^{18}	d_4^{25}
1	1.0061	1.0045	6	1.0441	1.0421	12	1.0912	1.0887
2	1.0136	1.0119	8	1.0596	1.0574	14	1.1072	1.1047
4	1.0288	1.0269	10	1.0753	1.0729			

KHCO₂, Formate [JAB]; with 4.21 %, $d_4^{20} = 1.0232$; with 13.67 %, $d_4^{21} = 1.0786$ (329, 463)**KHCO₃ [JAB] (342, 343), α (206)**; (432)* [LJG]**

°C	1 %	2 %	4 %	°C	1 %	2 %	4 %
0	1.0066	1.0134	1.0270	50	0.9949	1.0017	1.0154
10	1.0064	1.0132	1.0268	60	0.9901	0.9969	1.0106
15†	1.0058	1.0125	1.0260	70	0.9847	0.9915	1.0053
20	1.0049	1.0117	1.0252	80	0.9786	0.9855	0.9993
25	1.0038	1.0106	1.0241	90	0.9722	0.9791	0.9929
30	1.0024	1.0092	1.0228	100	0.9653	0.9722	0.9860
40	0.9990	1.0058	1.0195				

† $d_4^{15} = 1.0396$ with 6 %; = 1.0534 with 8 %; = 1.0674 with 10 %.**KHC₂O₄, Acid oxalate [JAB] (208)**

%	1	2	3	4
$d_4^{17.5}$	1.0050	1.0112	1.0174	1.0235

KC₂H₃O₂, Acetate [LJG] (287, 548, 632); (529)*; (18, 144, 211, 222, 223, 224, 342, 343, 344, 362, 451, 463, 561, 660) [JAB]**

%	d_4^{18}	d_4^{25}	%	d_4^{18}	d_4^{25}
1	1.0038	1.0022	22	1.1131	1.1104
2	1.0089	1.0072	24	1.1241	1.1213
4	1.0191	1.0173	26	1.1353	1.1324
6	1.0293	1.0274	28	1.1466	1.1436
8	1.0395	1.0375	30	1.1579	1.1549
10	1.0497	1.0476	35	1.1868	1.1835
12	1.0599	1.0577	40	1.2162	1.2127
14	1.0703	1.0680	45	1.2460	1.2423
16	1.0808	1.0784	50	1.2761	1.2723
18	1.0914	1.0889	55	1.3065	1.3026
20	1.1022	1.0996	60	1.3372	1.3330

KC₂H₃O₃, Glycolate [JAB]; with 5.71 %, $d_4^{20} = 1.0428$ (463)**KC₃H₅O₂, Propionate [JAB] (291)**; (463)**

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0029	10	1.0425	20	1.0880	30	1.1349
2	1.0073	12	1.0514	22	1.0973	32	1.1443
4	1.0160	14	1.0604	24	1.1067	34	1.1537
6	1.0248	16	1.0695	26	1.1161	36	1.1632
8	1.0336	18	1.0787	28	1.1255	38	1.1727

KC₃H₅O₃, Lactate [JAB]; with 6.41 %, $d_4^{20} = 1.0331$ (463)**KC₄H₃O₈, Tetroxalate [JAB]; $d_4^{17.5} = 1.0041$ with 1 %; = 1.0096 with 2 % (208)****KC₄H₅O₄, Acid succinate [JAB]; with 5.21 %, $d_4^{20} = 1.0246$ (463)****KC₄H₅O₅, Acid malate [JAB] (463, 546)****

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0034	8	1.0410	16	1.0865	24	1.1347
2	1.0087	10	1.0521	18	1.0983	26	1.1471
4	1.0193	12	1.0634	20	1.1103		
6	1.0301	14	1.0748	22	1.1224		

KC₄H₇O₂, n-Butyrate [JAB]; with 6.31 %, $d_4^{20} = 1.0223$ (463)**KC₄H₇O₂, Isobutyrate [JAB]; with 6.31 %, $d_4^{20} = 1.0225$ (463)****KC₆H₇O₇, Dihydrogen citrate [JAB]; with 5.75 %, $d_4^{20} = 1.0287$ (463)****K₂C₄H₄O₄, Succinate [JAB]; with 4.86 %, $d_4^{20} = 1.0288$ (463)****K₂C₄H₄O₅, Malate [JAB] (546)**; (463)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0047	12	1.0785	24	1.1662	45	1.3380
2	1.0112	14	1.0926	26	1.1816	50	1.3820
4	1.0244	16	1.1069	28	1.1972	55	1.4270
6	1.0377	18	1.1214	30	1.2130	60	1.4730
8	1.0511	20	1.1361	35	1.2530		
10	1.0647	22	1.1510	40	1.2950		

K₂C₄H₄O₆, Tartrate [JAB] (451, 463, 499, 500); (221, 222, 223, 329, 330, 432, 571, 632)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0048	10	1.0657	20	1.1387	30	1.2181
2	1.0114	12	1.0798	22	1.1540	35	1.2606
4	1.0248	14	1.0941	24	1.1696	40	1.3051
6	1.0383	16	1.1087	26	1.1855	45	1.3516
8	1.0519	18	1.1236	28	1.2017	50	1.4001

K₃C₆H₅O₇, Citrate [JAB] (632); (463)**

%	d_4^{18}	d_4^{25}	%	d_4^{18}	d_4^{25}
1	1.0054	1.0037	18	1.1272	1.1247
2	1.0122	1.0104	20	1.1427	1.1400
4	1.0259	1.0239	22	1.1584	1.1556
6	1.0398	1.0377	24	1.1743	1.1714
8	1.0538	1.0517	26	1.1905	1.1875
10	1.0680	1.0659	28	1.2070	1.2039
12	1.0824	1.0803	30	1.2237	1.2206
14	1.0971	1.0949	32	1.2406	1.2375
16	1.1120	1.1097	34	1.2578	1.2547

KC₂Cl₃O₂, Trichloroacetate [JAB]; 10.07%, $d_4^{20} = 1.0559$ (463)

KC₂H₂ClO₂, Chloroacetate [JAB]; with 6.63%, $d_4^{20} = 1.0354$ (463)

KC₂HCl₂O₂, Dichloroacetate [JAB]; with 8.35%, $d_4^{20} = 1.0447$ (463)

K₂CS₃(K₂SCS₂) [JAB] (143) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.006	12	1.085	24	1.176	45	1.347
2	1.013	14	1.100	26	1.191	50	1.393
4	1.028	16	1.115	28	1.206	55	1.441
6	1.042	18	1.130	30	1.221	60	1.491
8	1.056	20	1.146	35	1.261	65	1.544
10	1.070	22	1.161	40	1.303	70	1.600

KCH₃SO₄, Methyl sulfate [JAB]; with 45.79%, $d_4^{13.5} = 1.2914$ (155); with 14.67%, $d_4^{22} = 1.0794$ (329)

KC₂H₅SO₄, Hydroxyethyl sulfonate [JAB]; with 4.11%, $d_4^{25} = 1.0188$ (529)

KC₂H₅SO₄, Ethyl sulfate [JAB]; with 38.60%, $d_4^{12} = 1.2033$ (155); with 42.82%, $d_4^{13} = 1.2315$ (155); 15.47%, $d_4^{22} = 1.0737$ (329)

KC₆H₅SO₃, Benzene sulfonate [JAB]; 4.91%, $d_4^{25} = 1.0181$ (529)

K₂CH₂S₂O₆, Methane disulfonate [JAB]; 3.15%, $d_4^{25} = 1.0178$ (529)

KCN† [JAB] (378) (20°C); (342, 343, 602)** (15°C); (561) (15°C); 517** (25°C) [LJG]**

%	1	2	4	6	8	10
d_4^{15}	1.0041	1.0092	1.0194	1.0297	1.0401	1.0506
d_4^{20}	1.0035	1.0088	1.0195	1.0301	1.0408	1.0514
d_4^{25}	1.0024	1.0078	1.0187	1.0298		
%	12	14	16	18		
d_4^{15}	1.0612	1.0718	1.0825	1.0931		
d_4^{20}	1.0620	1.0727				

† Isotherms are discordant.

KCNO [JAB] (602) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0051	10	1.0603	20	1.1242	30	1.1908
2	1.0111	12	1.0728	22	1.1373	32	1.2046
4	1.0232	14	1.0855	24	1.1505	34	1.2185
6	1.0355	16	1.0983	26	1.1638		
8	1.0479	18	1.1112	28	1.1772		

KCNSe [LJG]; with 32.77%, $d_4^{25} = 1.1514$; with 43.55%, $d_4^{22.1} = 1.2455$ (663)

KSbOC₄H₄O₆, Antimonyl tartrate [JAB] (224)

%	1	2	3	4	5	6
$d_4^{17.5}$	1.005	1.012	1.019	1.026	1.034	1.042

KCNS [JAB] (236, 287, 548); (602, 640) [LJG]**

%	d_4^{18}	%	d_4^{18}	%	d_4^{26}
1	1.0035	16	1.0817	35	1.1899
2	1.0085	18	1.0927	40	1.2200
4	1.0186	20	1.1039	45	1.2517
6	1.0288	22	1.1152	50	1.2849
8	1.0391	24	1.1266	55	1.3195
10	1.0495	26	1.1382	60	1.3554
12	1.0601	28	1.1500	65	1.3925
14	1.0708	30	1.1618	70	1.4307

K₂SiO₃ [JAB] (602) [LJG]

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0072	8	1.0727	16	1.1533	24	1.2411
2	1.0163	10	1.0923	18	1.1745	26	1.2644
4	1.0347	12	1.1123	20	1.1962	28	1.2884
6	1.0535	14	1.1326	22	1.2184		

K₂SnO₃ [LJG]; $d_4^{20} = 1.212$ with 22.73%; = 1.379 with 36.53% (602)

K₂SO₄.PbSO₄ [JAB] (75) [LJG]

%	0.2	0.4	0.6	0.8
d_4^{22}	0.99935	1.00092	1.00252	1.00415

K₂Zn(SO₄)₂ [GS]; with 10%, $d_4^{15} = 1.0938$ (534)

K₂CdI₄ [GS] (249); (641)**

%	d_4^{13}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
2	1.0143	10	1.0808	18	1.1564	35	1.3556
4	1.0303	12	1.0988	20	1.1766	40	1.4280
6	1.0467	14	1.1174	25	1.2310	45	1.5066
8	1.0635	16	1.1366	30	1.2903		

K₂HgI₄ [GS] (550)

%	8	10	12
d_4^{16}	1.0650	1.0824	1.1003

2KCl.CuCl₂ [WCS] (319, 321)

%	$d_4^{25?}$	%	$d_4^{25?}$	%	$d_4^{25?}$	%	$d_4^{25?}$
1	1.0075	6	1.0468	12	1.0968	18	1.1502
2	1.0151	8	1.0633	14	1.1142	20	1.1688
4	1.0306	10	1.0800	16	1.1320		

K₂SO₄.CuSO₄ [WCS] (189, 191, 604)

%	d_4^{18}	%	d_4^{18}	%	$d_4^{20.2}$
0.755	1.0039	6.874	1.0606	14.31	1.0692

KAg(CN)₂ [WCS] (602)

KAu(CN)₂ [WCS] (602)

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0055	6	1.0387	1	1.0068
2	1.0120	8	1.0526	2	1.0145
4	1.0252			4	1.0300

K₂IrCl₆ [WCS]; with 1% $d_4^{20} = 1.005$ (602)

K₂PtCl₄ [WCS] (602)

%	1	2	4	6	8
d_4^{20}	1.0057	1.0134	1.0295	1.0460	1.0628

K₂PtCl₆ [WCS]; with 1% $d_4^{20} = 1.005$ (602)

K₂PdCl₄ [WCS] (602)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0050	2	1.0120	4	1.0265	6	1.0415

KMnO₄ [JAB] (509, 510, 602, 603); (144, 241, 242, 529, 561) [LJG]**

%	1	2	3	4	5	6
d_4^{15}	1.0060	1.0130	1.0200	1.0271	1.0342	1.0414
d_4^{20}	1.0049	1.0117	1.0185	1.0254	1.0324	
$d_4^{25}†$	1.0037	1.0104	1.0172	1.0240	1.0309	1.0379

† $d_4^{25} = 1.0450$ with 7%; = 1.0457 with 7.1% (satd. soln.).

K₂SO₄.Fe₂(SO₄)₃† [WCS] (188, 208, 225)

%	d_4^{15} (225)	$d_4^{17.5}$	%	d_4^{15} (225)	$d_4^{17.5}$
1	1.0079	1.0082	12	1.1100	1.0930
2	1.0167	1.0179	14	1.1303	1.1100
4	1.0341	1.0336	16	1.1511	1.1293
6	1.0525	1.0473	18	1.1731	
8	1.0711	1.0617	20	1.1960	
10	1.0904	1.0768			

† Discordant data.

K₃Fe(CN)₆ [WCS] (291); (511)*; (1, 158, 221, 375, 506, 536, 629)**

%	d_4^{15}	d_4^{20}	d_4^{25}
1	1.0047	1.0034	1.0024
2	1.0101	1.0090	1.0078
4	1.0212	1.0201	1.0188
6	1.0325	1.0314	1.0300
8	1.0438	1.0427	1.0413
10	1.0556	1.0542	1.0526
12	1.0671	1.0656	1.0641
14	1.0789	1.0774	1.0756
16	1.0910	1.0890	1.0870
18	1.1030	1.1010	1.0990
20	1.1150	1.1130	1.1110

K₄Fe(CN)₆ [WCS] (291); (511, 536)*; (158, 221, 266, 506, 629)**

%	d_4^{15}	d_4^{20}	d_4^{25}
1	1.0058	1.0051	1.0039
2	1.0125	1.0119	1.0106
4	1.0264	1.0256	1.0242
6	1.0404	1.0395	1.0376
8	1.0545	1.0536	1.0514
10	1.0687	1.0678	1.0653
12	1.0835	1.0823	1.0795
14	1.0985	1.0971	1.0942
16	1.1139	1.1120	1.1089

K₂CrO₄ [JAB] (548, 602); (287)*; (101, 138, 144, 206, 360, 361, 463, 533, 561, 566, 629) [LJG]**

%	d_4^{15}	d_4^{18}	%	d_4^{18}
1	1.0073	1.0066	16	1.1366
2	1.0155	1.0147	18	1.1555
4	1.0321	1.0311	20	1.1748
6	1.0489	1.0477	22	1.1945
8	1.0659	1.0647	24	1.2147
10	1.0832	1.0821	26	1.2354
12	1.1009	1.0999	28	1.2566
14		1.1181	30	1.2784

K₂Cr₂O₇ [JAB] (184, 291, 360, 509, 510); (361)*; (138, 144, 205, 206, 328, 463, 561, 566) [LJG]**

%	1	2	4	6	8	10
d_4^{10}	1.0069	1.0141	1.0287	1.0435	1.0585	1.0738
d_4^{18}	1.0054	1.0124	1.0266	1.0412	1.0561	
d_4^{20} †....	1.0052	1.0122	1.0264	1.0408	1.0554	1.0703

† With 12 %, $d_4^{20} = 1.0855$.**K₂SO₄.Cr₂(SO₄)₃ [JAB] (225)**; (187, 188) [LJG]**

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
"Violet"		"Green"		"Green"		"Green"	
1	1.0086	1	1.007	14	1.129	28	1.289
2	1.0182	2	1.016	16	1.150	30	1.315
4	1.0376	4	1.034	18	1.171	35	1.383
6	1.0573	6	1.052	20	1.193	40	1.456
8	1.0773	8	1.070	22	1.216	45	1.533
		10	1.089	24	1.239	50	1.615
		12	1.109	26	1.263		

K₂MoO₄ [JAB] (602) [LJG]

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0071	6	1.0484	10	1.0834	14	1.1200
2	1.0152	8	1.0657	12	1.1015	16	1.1389
4	1.0316						

2K₂O.SiO₂.12MoO₃ [LJG] (13)

%	d_4^{10}	d_4^{20}	%	d_4^{10}	d_4^{20}
1	1.0074	1.0058	10	1.0845	1.0822
2	1.0152	1.0135	12	1.1034	1.1009
4	1.0315	1.0297	14	1.1228	1.1202
6	1.0486	1.0466	16	1.1429	1.1401
8	1.0663	1.0641			

K₂WO₄ [LJG] (602)

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
1	1.0077	6	1.0523	12	1.1105	18	1.1750
2	1.0164	8	1.0711	14	1.1312		
4	1.0341	10	1.0905	16	1.1527		

KVO₃ [LJG] (602)

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
0.5	1.00186	2	1.0128	4	1.0277	6	1.0430
1	1.0055	3	1.0202	5	1.0353	7	1.0508

K₂SO₄.Al₂(SO₄)₃ [JAB] (225, 342, 343, 404, 406, 509); (510)*; (46, 144, 205, 206, 223, 378) [LJG]**

%	d_4^{15}	d_4^{20}	%	d_4^{15}	d_4^{20}
1	1.0086	1.0078	5	1.0476	1.0469
2	1.0182	1.0175	6	1.0577	1.0569
3	1.0279	1.0272	7	1.0679	
4	1.0377	1.0370			

**K₂Mg(SO₄)₂ [GS]; with 15.4 %, $d_4^{14} = 1.1457$ (536, 537)
KNaC₄H₄O₆, Tartrate [LJG] (221, 650); (222, 223, 432, 451)*; (509) [JAB]****

%	20°C	25°C	30°C	40°C	50°C	60°C
1	1.0049	1.0037	1.0022	0.9987	0.9945	0.9897
2	1.0116	1.0103	1.0088	1.0053	1.0010	0.9961
4	1.0252	1.0238	1.0222	1.0186	1.0142	1.0092
6	1.0390	1.0375	1.0358	1.0322	1.0276	1.0225
8	1.0530	1.0514	1.0496	1.0459	1.0413	1.0360
10	1.0673	1.0656	1.0637	1.0599	1.0552	1.0498
12	1.0818	1.0800	1.0781	1.0741	1.0693	1.0638
14	1.0965	1.0946	1.0926	1.0885	1.0836	1.0780
16	1.1114	1.1094	1.1073	1.1031	1.0981	1.0925
18	1.1265	1.1244	1.1222	1.1180	1.1128	1.1072
20	1.1419	1.1397	1.1374	1.1331	1.1278	1.1221
22	1.1576	1.1552	1.1529	1.1485	1.1431	1.1373
24	1.1735	1.1710	1.1687	1.1641	1.1586	1.1527
26	1.1896	1.1870	1.1847	1.1799	1.1743	1.1683
28	1.2059	1.2033	1.2009	1.1959	1.1902	1.1841
30	1.2225	1.2198	1.2173	1.2121	1.2064	1.2002
32	1.2394	1.2366	1.2340	1.2286	1.2229	1.2166
34	1.2566	1.2537	1.2510	1.2454	1.2397	1.2333
36	1.2742	1.2712	1.2684	1.2626	1.2568	1.2503

RbOH [JAB] (212, 290)**

%	d_4^{18}	d_4^{25}	%	d_4^{18}
1	1.0080	1.0065	16	1.1665
2	1.0174	1.0158	18	1.1905
4	1.0368	1.0346	20	1.2152
6	1.0568	1.0535	22	1.2407
8	1.0774	1.0725	24	1.2670
10	1.0987	1.0916	26	1.2941
12	1.1206		28	1.3220
14	1.1432			

RbF [JAB] (291)

%	d_4^{18}	%	d_4^{18}	%	d_4^{18}	%	d_4^{18}
1	1.0074	10	1.0920	20	1.2000	30	1.3259
2	1.0163	12	1.1123	22	1.2236	32	1.3535
4	1.0345	14	1.1332	24	1.2479		
6	1.0532	16	1.1548	26	1.2731		
8	1.0723	18	1.1771	28	1.2991		

RbCl [JAB] (26)**; (83, 84, 111, 256, 287, 288, 548), α (256)*;
(45, 125, 206, 224, 378, 487, 629), α (607, 609)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C
1	1.00749	1.00722	1.00561	1.00441	1.00298	0.99950	0.99528
2	1.01519	1.01478	1.01307	1.01183	1.01036	1.00683	1.00257
4	1.03085	1.03017	1.02825	1.02693	1.02539	1.02176	1.01741
6	1.04686	1.04592	1.04379	1.04239	1.04078	1.03704	1.03260
8	1.06324	1.06205	1.05971	1.05823	1.05655	1.05269	1.04816
10	1.08002	1.07859	1.07604	1.07448	1.07273	1.06874	1.06412
12	1.09723	1.09556	1.09281	1.09117	1.08935	1.08522	1.08051
14	1.11488	1.11299	1.11004	1.10832	1.10643	1.10216	1.09736
16	1.13299	1.13090	1.12775	1.12595	1.12399	1.11959	1.11469
18	1.15158	1.14931	1.14596	1.14408	1.14205	1.13753	1.13252
20	1.17067	1.16824	1.16469	1.16273	1.16063	1.15600	1.15088
22	1.19030	1.18771	1.18396	1.18192	1.17975	1.17502	1.16979
24	1.21049	1.20774	1.20379	1.20167	1.19943	1.19461	1.18927
26	1.23127	1.22836	1.22421	1.22201	1.21970	1.21479	1.20934
28	1.25268	1.24959	1.24524	1.24296	1.24058	1.23558	1.23002
30	1.27475	1.27145	1.26691	1.26455	1.26210	1.25701	1.25134
35			1.32407	1.32151	1.31891	1.31354	1.30763
40			1.38599	1.38318	1.38041	1.37476	1.36861
45			1.45330	1.45018	1.44721	1.44127	1.43489
50			1.52675	1.52325	1.52005	1.51381	1.50720

RbClO₃ [JAB] (84) [LJG]

%	1	2	3	4
$d_4^{19.5}$	1.00530	1.01224	1.01915	1.02602

RbBr [JAB] (26)**; (83, 84, 111, 288)*; (378)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C
1	1.00776	1.00751	1.00593	1.00473	1.00329	0.99981	0.99559
2	1.01574	1.01539	1.01372	1.01248	1.01101	1.00747	1.00321
4	1.03207	1.03150	1.02965	1.02833	1.02679	1.02314	1.01878
6	1.04887	1.04808	1.04604	1.04464	1.04303	1.03927	1.03480
8	1.06616	1.06515	1.06291	1.06143	1.05975	1.05588	1.05129
10	1.08396	1.08272	1.08028	1.07872	1.07697	1.07298	1.06827
12	1.10229	1.10082	1.09817	1.09653	1.09471	1.09059	1.08576
14	1.12118	1.11947	1.11661	1.11489	1.11300	1.10874	1.10379
16	1.14065	1.13870	1.13563	1.13383	1.13186	1.12746	1.12239
18	1.16073	1.15854	1.15526	1.15338	1.15132	1.14678	1.14159
20	1.18145	1.17902	1.17554	1.17357	1.17142	1.16674	1.16143
22	1.20285	1.20018	1.19650	1.19443	1.19219	1.18737	1.18194
24	1.22497	1.22206	1.21817	1.21600	1.21367	1.20871	1.20315
26	1.24784	1.24470	1.24059	1.23832	1.23590	1.23080	1.22510
28	1.27150	1.26814	1.26380	1.26143	1.25892	1.25367	1.24783
30	1.29599	1.29241	1.28784	1.28536	1.28277	1.27735	1.27138
35	1.36125	1.35705	1.35191	1.34917	1.34634	1.34051	1.33416
40		1.42830	1.42233	1.41924	1.41616	1.40991	1.40319
45		1.50712	1.50010	1.49654	1.49321	1.48653	1.47945
50			1.58639	1.58222	1.57863	1.57151	1.56408
55			1.68254	1.67758	1.67372	1.66615	1.65838

RbBrO₃ [JAB] (84) [LJG]

%	0.5	1.0	1.5
$d_4^{19.5}$	1.00220	1.00609	1.01001

RbI [JAB] (26)**; (83, 84, 111, 288, 548)*; (229)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C
1	1.00776	1.00751	1.00591	1.00471	1.00327	0.99978	0.99555
2	1.01576	1.01540	1.01370	1.01246	1.01099	1.00744	1.00315
4	1.03210	1.03153	1.02963	1.02831	1.02677	1.02309	1.01868
6	1.04892	1.04814	1.04604	1.04464	1.04303	1.03922	1.03469
8	1.06624	1.06525	1.06296	1.06147	1.05979	1.05585	1.05120
10	1.08409	1.08289	1.08041	1.07883	1.07708	1.07300	1.06823
12	1.10250	1.10109	1.09842	1.09675	1.09492	1.09070	1.08580
14	1.12150	1.11988	1.11701	1.11525	1.11333	1.10898	1.10394
16	1.14112	1.13929	1.13621	1.13436	1.13235	1.12787	1.12268
18	1.16140	1.15935	1.15605	1.15411	1.15201	1.14739	1.14204
20	1.18237	1.18010	1.17657	1.17453	1.17234	1.16757	1.16206
22	1.20406	1.20157	1.19781	1.19566	1.19338	1.18844	1.18278
24	1.22651	1.22379	1.21980	1.21754	1.21516	1.21004	1.20424
26	1.24975	1.24680	1.24257	1.24020	1.23772	1.23241	1.22647
28	1.27382	1.27063	1.26616	1.26368	1.26110	1.25559	1.24951
30	1.29876	1.29532	1.29061	1.28801	1.28534	1.27962	1.27340
35	1.36537	1.36131	1.35598	1.35307	1.35014	1.34389	1.33729
40	1.43873	1.43403	1.42806	1.42481	1.42158	1.41480	1.40776
45	1.51993	1.51456	1.50792	1.50428	1.50075	1.49337	1.48582
50	1.61033	1.60426	1.59691	1.59281	1.58898	1.58091	1.57276
55	1.71156	1.70476	1.69667	1.69203	1.68790	1.67904	1.67017
60			1.80924				1.78004
65			1.93722				1.90492

RbIO₃ [JAB] (84) [LJG]

%	0.5	1.0	1.5
$d_4^{19.5}$	1.0025	1.0068	1.0111

Rb₂SO₄ [JAB] (111, 288, 616)**; (615)

%	0°C	10°C	20°C	25°C	30°C	40°C	50°C
1	1.0086	1.0082	1.0066	1.0054	1.0039	1.0003	0.9961
2	1.0173	1.0168	1.0150	1.0138	1.0122	1.0085	1.0041
4	1.0350	1.0343	1.0322	1.0309	1.0292	1.0253	1.0208
6	1.0530	1.0521	1.0499	1.0485	1.0467	1.0426	1.0382
8	1.0714	1.0703	1.0680	1.0664	1.0646	1.0603	1.0560
10	1.0903	1.0889	1.0864	1.0848	1.0829	1.0786	1.0743
12	1.1096	1.1080	1.1052	1.1036	1.1016	1.0972	1.0931
14	1.1294	1.1276	1.1246	1.1229	1.1209	1.1165	1.1123
16	1.1498	1.1477	1.1446	1.1428	1.1407	1.1364	1.1321
18	1.1708	1.1685	1.1652	1.1633	1.1611	1.1568	1.1525
20	1.1926	1.1900	1.1864	1.1844	1.1822	1.1779	1.1735
22	1.2151	1.2121	1.2083	1.2062	1.2040	1.1996	1.1951
24		1.2349	1.2309	1.2287	1.2265		
26		1.2583	1.2542	1.2519	1.2498		
28		1.2824	1.2782	1.2759	1.2739		
30		1.3071	1.3028	1.3006	1.2985		
32		1.3325	1.3281	1.3260	1.3238		

Rb₂SeO₄ [LJG]; $d_4^{20} = 1.4688$ with 40.60 %; = 1.5806 with 47.07 %
(614)

RbNO₃ [JAB] (84, 111, 288)**; (45, 76)

%	0°C	10°C	20°C	25°C	30°C
1	1.0073	1.0070	1.0053	1.0042	1.0027
2	1.0147	1.0143	1.0125	1.0113	1.0098
4	1.0298	1.0292	1.0272	1.0258	1.0242
6	1.0452	1.0444	1.0422	1.0407	1.0389
8	1.0610	1.0600	1.0575	1.0559	1.0540
10	1.0772	1.0760	1.0731	1.0715	1.0695
12	1.0938	1.0923	1.0892	1.0875	1.0854
14	1.1109	1.1090	1.1057	1.1040	1.1018
16	1.1284	1.1261	1.1227	1.1209	1.1187
18	1.1464	1.1437	1.1401	1.1382	1.1360
20	1.1649	1.1618	1.1580	1.1560	1.1537
22	1.1839	1.1804	1.1763	1.1742	1.1718

RbNO₃—(Continued)

%	0°C	10°C	20°C	25°C	30°C
24	1.2033	1.1995	1.1952	1.1929	1.1903
26			1.2146	1.2121	1.2093
28			1.2346	1.2319	1.2289
30			1.2552	1.2523	1.2490
32			1.2764	1.2732	1.2697

Values for 13.395 % (256)

d_4^0	d_4^{10}	d_4^{20}	d_4^{25}	d_4^{30}	d_4^{40}	d_4^{50}
1.10632	1.10404	1.10084	1.09898	1.09689	1.09222	1.08699

† With 7.023 %, $d_4^{20} = 1.04989$.RbCHO₂, Formate; [JAB] with 7.60 %, $d_4^{20.0} = 1.0494$ (329)Rb₂C₄H₄O₆, Tartrate [JAB] (498, 516)**

%	d_4^{20}	%	d_4^{20}	%	d_4^{20}	%	d_4^{20}
1	1.0056	12	1.0907	24	1.1989	45	1.4380
2	1.0130	14	1.1074	26	1.2188	50	1.5070
4	1.0280	16	1.1247	28	1.2393	55	1.5810
6	1.0432	18	1.1425	30	1.2605	60	1.6610
8	1.0587	20	1.1608	35	1.3150	65	1.7470
10	1.0745	22	1.1796	40	1.3740		

Rb₂SO₄.Al₂(SO₄)₃ [JAB]; with 0.32 % $d_4^0 = 1.0025$ (206) [LJG]
 CsCl [JAB] (26)**; (83, 84, 110, 256, 287, 548), α (256)*; (45, 206, 261, 487, 507, 508, 629)

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.00774	1.00751	1.00593	1.00473	1.00330	0.99982
2	1.01573	1.01540	1.01374	1.01251	1.01105	1.00752
4	1.03204	1.03151	1.02969	1.02839	1.02687	1.02324
6	1.04881	1.04808	1.04609	1.04472	1.04314	1.03941
8	1.06607	1.06514	1.06297	1.06153	1.05988	1.05605
10	1.08384	1.08271	1.08036	1.07884	1.07712	1.07319
12	1.10214	1.10082	1.09828	1.09668	1.09489	1.09085
14	1.12100	1.11949	1.11676	1.11507	1.11321	1.10906
16	1.14044	1.13874	1.13582	1.13404	1.13211	1.12785
18	1.16049	1.15860	1.15549	1.15362	1.15162	1.14724
20	1.18118	1.17910	1.17580	1.17385	1.17178	1.16727
22	1.20255	1.20028	1.19679	1.19476	1.19262	1.18798
24	1.22463	1.22218	1.21849	1.21638	1.21417	1.20940
26	1.24746	1.24482	1.24093	1.23874	1.23645	1.23156
28	1.27108	1.26824	1.26414	1.26187	1.25950	1.25450
30	1.29553	1.29248	1.28817	1.28581	1.28337	1.27826
35	1.36061	1.35699	1.35218	1.34960	1.34695	1.34149
40	1.43198	1.42777	1.42245	1.41964	1.41677	1.41094
45	1.51059	1.50578	1.49993	1.49688	1.49378	1.48755
50	1.59757	1.59215	1.58575	1.58245	1.57910	1.57244
55	1.69466	1.68842	1.68137	1.67776	1.67413	1.66701
60	1.80353	1.79644	1.78859	1.78460	1.78066	1.77304
65			1.90966	1.90523	1.90097	1.89278

%	50°C	60°C	80°C	%	50°C	60°C	80°C
1	0.99561	0.9908	0.9793	24	1.20416	1.1985	1.1853
2	1.00327	0.9984	0.9869	26	1.22621	1.2205	1.2071
4	1.01891	1.0140	1.0023	28	1.24904	1.2432	1.2297
6	1.03500	1.0300	1.0182	30	1.27269	1.2667	1.2531
8	1.05156	1.0465	1.0346	35	1.33566	1.3295	1.3154
10	1.06861	1.0635	1.0514	40	1.40483	1.3984	1.3838
12	1.08618	1.0810	1.0688	45	1.48113	1.4744	1.4593
14	1.10430	1.0991	1.0867	50	1.56567	1.5586	1.5429
16	1.12300	1.1177	1.1051	55†	1.65984	1.6524	1.6361
18	1.14230	1.1369	1.1242	60	1.76541	1.7576	1.7406
20	1.16224	1.1568	1.1439	65	1.88462	1.8763	1.8585
22	1.18285	1.1773	1.1643				

† $d_4^{100} = 1.616$ with 55%; = 1.717 with 60%; = 1.832 with 65%; = 1.968 with 70 %.Rb₂SO₄.Fe₂(SO₄)₃ [WCS] (378)

%	1	2	4	6
d_4^{20}	1.0070	1.0155	1.0335	1.0518

CsClO₃ [JAB] (84) [LJG]

%	1	2	3	4	5
$d_4^{19.5}$	1.00573	1.01322	1.02082	1.02851	1.03629

CsBr [JAB] (26)**; (83, 84, 291)*

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.00792	1.00769	1.00612	1.00492	1.00349	1.00001
2	1.01608	1.01577	1.01412	1.01289	1.01143	1.00790
4	1.03277	1.03228	1.03048	1.02918	1.02766	1.02403
6	1.04996	1.04929	1.04734	1.04597	1.04439	1.04065
8	1.06768	1.06683	1.06472	1.06328	1.06164	1.05779
10	1.08596	1.08493	1.08265	1.08114	1.07943	1.07547
12	1.10483	1.10362	1.10116	1.09958	1.09779	1.09372
14	1.12432	1.12293	1.12029	1.11863	1.11676	1.11257
16	1.14447	1.14289	1.14007	1.13832	1.13637	1.13206
18	1.16531	1.16354	1.16053	1.15869	1.15666	1.15222
20	1.18688	1.18491	1.18170	1.17978	1.17767	1.17309
22	1.20922	1.20704	1.20362	1.20162	1.19944	1.19471
24	1.23238	1.22998	1.22634	1.22425	1.22200	1.21712
26	1.25639	1.25377	1.24990	1.24772	1.24539	1.24037
28	1.28129	1.27844	1.27435	1.27208	1.26966	1.26450
30	1.30712	1.30404	1.29973	1.29737	1.29486	1.28954
35	1.37619	1.37251	1.36764	1.36503	1.36230	1.35658
40	1.45248	1.44819	1.44275	1.43986	1.43689	1.43074
45	1.53717	1.53227	1.52626	1.52305	1.51981	1.51317
50			1.61970	1.61610	1.61253	1.60531
55			1.72492	1.72081	1.71679	1.70888

%	50°C	60°C	80°C	%	50°C	60°C	80°C
1	0.99580	0.9909	0.9794	22	1.18940	1.1836	1.1703
2	1.00364	0.9987	0.9872	24	1.21170	1.2058	1.1923
4	1.01968	1.0147	1.0029	26	1.23483	1.2288	1.2151
6	1.03621	1.0311	1.0192	28	1.25883	1.2526	1.2387
8	1.05325	1.0481	1.0360	30	1.28373	1.2774	1.2633
10	1.07083	1.0656	1.0533	35	1.35039	1.3438	1.3290
12	1.08898	1.0836	1.0712	40	1.42414	1.4171	1.4018
14	1.10772	1.1023	1.0897	45	1.50613	1.4987	1.4827
16	1.12709	1.1216	1.1088	50	1.59780	1.5899	1.5731
18	1.14713	1.1416	1.1286	55	1.70088	1.6925	1.6749
20	1.16789	1.1622	1.1491				

CsBrO₃ [JAB] (84) [LJG]

%	0.5	1.0	1.5
$d_4^{19.5}$	1.00225	1.00621	1.01022

CsI [JAB] (26)**; (83, 84)*

%	0°C	10°C	20°C	25°C	30°C	40°C
1	1.00787	1.00765	1.00608	1.00487	1.00344	0.99996
2	1.01598	1.01568	1.01402	1.01279	1.01133	1.00779
4	1.03258	1.03212	1.03029	1.02899	1.02747	1.02382
6	1.04970	1.04907	1.04707	1.04570	1.04411	1.04035
8	1.06737	1.06655	1.06438	1.06294	1.06128	1.05740
10	1.08561	1.08459	1.08225	1.08074	1.07901	1.07500
12	1.10445	1.10323	1.10071	1.09912	1.09732	1.09318
14	1.12392	1.12250	1.11979	1.11811	1.11624	1.11196
16	1.14406	1.14244	1.13953	1.13775	1.13580	1.13138
18	1.16490	1.16308	1.15996	1.15808	1.15604	1.15148
20	1.18648	1.18446	1.18112	1.17915	1.17701	1.17230
22	1.20884	1.20661	1.20305	1.20099	1.19875	1.19388
24	1.23203	1.22958	1.22580	1.22364	1.22131	1.21627
26	1.25609	1.25342	1.24942	1.24715	1.24473	1.23952
28	1.28107	1.27817	1.27395	1.27157	1.26906	1.26368
30	1.30701	1.30388	1.29944	1.29694	1.29434	1.28878

CsI.—(Continued)

%	0°C	10°C	20°C	25°C	30°C	40°C
35			1.36776	1.36497	1.36203	1.35593
40			1.44354	1.44044	1.43711	1.43037
45			1.52803	1.52460	1.52082	1.51332
50			1.62278	1.61900	1.61470	1.60627

%	50°C	60°C	80°C	%	50°C	60°C	80°C
1	0.99573	0.9909	0.9794	20	1.16702	1.1611	1.1475
2	1.00351	0.9986	0.9870	22	1.18847	1.1825	1.1686
4	1.01943	1.0144	1.0026	24	1.21071	1.2046	1.1904
6	1.03585	1.0307	1.0187	26	1.23379	1.2275	1.2131
8	1.05279	1.0476	1.0353	28	1.25776	1.2513	1.2367
10	1.07028	1.0650	1.0525	30	1.28267	1.2761	1.2612
12	1.08835	1.0829	1.0702	35	1.34938	1.3424	1.3269
14	1.10702	1.1015	1.0885	40	1.42329	1.4159	1.3996
16	1.12633	1.1207	1.1075	45	1.50560	1.4976	1.4806
18	1.14632	1.1406	1.1271	50	1.59778	1.5892	1.5714

CsIO₃ [JAB] (84) [LJG]

%	0.5	1.0	1.5	2.0
d_4^{20}	1.0025	1.0068	1.0112	1.0156

Cs₂SO₄ [JAB] (616)**; (615)

%	10°C	20°C	25°C	30°C	40°C	50°C
1	1.0080	1.0061	1.0050	1.0038	1.0006	0.9962
2	1.0164	1.0144	1.0132	1.0119	1.0087	1.0046
4	1.0338	1.0316	1.0304	1.0291	1.0259	1.0220
6	1.0517	1.0494	1.0480	1.0464	1.0431	1.0396
8	1.0703	1.0676	1.0661	1.0645	1.0613	1.0576
10	1.0897	1.0870	1.0856	1.0841	1.0807	1.0770
12	1.1099	1.1071	1.1056	1.1041	1.1009	1.0973
14	1.1305	1.1275	1.1260	1.1245	1.1212	1.1177
16	1.1514	1.1484	1.1469	1.1453	1.1419	1.1383
18	1.1728	1.1696	1.1680	1.1663	1.1628	1.1592
20	1.1944	1.1913	1.1897	1.1880	1.1842	1.1800
22	1.2167	1.2137	1.2122	1.2105	1.2065	1.2017
24	1.2408	1.2375	1.2359	1.2341	1.2302	1.2252
26	1.2681	1.2643	1.2623	1.2602	1.2561	1.2513

Cs₂SeO₄ [LJG]; $d_4^{20} = 1.5841$ with 45.94%; = 1.7432 with 53.43% (614)

CsNO₃ [JAB] (84, 291, 420)**; (45, 76, 633)

%	0°C	10°C	20°C	25°C	17.076%	(256)†
1	1.00759	1.00727	1.00566	1.00445	°C	d_4^t
2	1.01539	1.01492	1.01319	1.01194	20	1.14091
4	1.03128	1.03055	1.02859	1.02725	30	1.13681
6	1.04755	1.04661	1.04443	1.04299	40	1.13191
8	1.06422	1.06313	1.06072	1.05918	50	1.12652
10		1.08013	1.07745	1.07584		
12		1.09761	1.09463	1.09298		
14			1.11227	1.11062		

† $d_4^{20} = 1.07001$ with 9.104% (256).

CsCHO₂, Formate [JAB]; with 2.73%, $d_4^{21.0} = 1.0169$ (329)

SYSTEMS CONTAINING MORE THAN ONE SOLUTE¹

Contents

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¹ This section was compiled by Ralph F. Tefft under the direction of the Special Editor.	

Both inorganic and organic solutes present.

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Abbreviations and Symbols

% Wt. %.

g Grams per liter.

Mol % Formula weights per 100 formula wts. of mixture.

Vol. % cm³ per 100 cm³.

M g-equivalents/kg of solution.

m g-equivalents/kg of solvent.

N g-equivalents/liter of solution.

satd. Saturated solution.

? Doubtful.

In most cases no concentration is indicated for isolated points.

A-B TABLE, STANDARD ARRANGEMENT (*v. p.* viii)

Two Solutes

H₂O

C	<i>t</i> , °C	Concn. range		Lit.
		B	C	
B = HCl				
H ₂ SO ₄	15			(144)
	17	0-43 %	0-90 %	(126)
	40	0-36 %	4-84 %	(126)
	70	0-33 %	2-84 %	(126)
HNO ₃	?	4-10 %	17-40 %	(257)
NH ₄ Cl.....	0	0-6 N	satd.	(172, 177)
	20			(463)
(NH ₄) ₂ SO ₄	20			(462, 466)
SbCl ₃	?	?	270-2160 g	(27)
BiCl ₃	?	?	330-1300 g	(27)
BiOCl.....	25	0.35-6.1 <i>m</i> in Cl	satd.	(456)
SnCl ₂	0	0-7.8 N	satd.	(178)
SnCl ₄	28			(178)
PbCl ₂	0	0-11.2 N	satd.	(178)
ZnCl ₂	20			(462, 466)
ZnSO ₄	20			(462, 466)
CdCl ₂	25	0.12-1 N	0.12-1 N	(328)
HgCl ₂	0	0-7.1 N	satd.	(178)
	20			(378)
	25	0.12-1 N	0.12-1 N	(328)
	25			(659)
CuCl ₂	0	0-34 Mol %	23-49 Mol %	(105)
	0	0-12.8 N	satd.	(178)
	18			(604)
	20			(462, 466)
	25			(659)
Cu ₂ Cl ₂	0	0.9-6 N	satd.	(178)
CuSO ₄	20			(462, 466)
MnCl ₂	12			(506)
FeCl ₃	25	0.12-1 N	0.12-1 N	(328)
CoCl ₂	0	0-13.9 N	satd.	(178)
	20	0-10.6 N	constant (not given)	(305)
	25			(659)
U(SO ₄) ₂	16-18	<i>d</i> = 1.046	1-5 %	(119, 121)
PrCl ₃	16			(413)
MgCl ₂	?	?	satd.	(174)
	0	0-7.6 N	satd.	(177)
	20			(462, 466)
MgSO ₄	20			(462, 466)
CaCl ₂	?	?	satd.	(174)
	0	0-9.5 N	satd.	(177)
SrCl ₂	0	0-2.3 N	satd.	(172)
	0	0-5.3 N	satd.	(177)
	25	0-9.2 <i>m</i>	satd.	(263)

C	t, °C	Concn. range		Lit.
		B	C	
B = HCl.—(Continued)				
BaCl ₂	0	0-5 N	satd.	(172, 177)
	30	0-10.25 N	satd.	(411)
LiCl.....	0	0-8.1 N	satd.	(177)
NaOH.....	15	series of mixtures		(300)
NaCl.....	0	0.1-5.6 N	satd.	(172)
	0	0-5.6 N	satd.	(177)
	20			(463)
	20	series of mixtures		(464)
	30	0-7.2 N	satd.	(411)
Na ₂ SO ₄	20			(462, 466)
	20	series of mixtures		(464)
NaC ₂ HCl ₂ O ₂ , Dichloro- acetate.....	20			(463)
KCl.....	0	0-6.5 N	satd.	(177)
	20			(463)
K ₂ SO ₄	20			(462, 466)
KC ₂ HCl ₂ O ₂ , Dichloro- acetate.....	20			(463)
B = Br ₂				
NaBr.....	25	satd.	92-408 g	(31)
KBr.....	0			(316)
	32.4	0-5 m	satd.	(326)
B = HBr				
NH ₄ Br.....	20			(463)
UO ₂ (NO ₃) ₂	15-17	d = 1.21	1-5 %	(118, 124)
SrCl ₂	25	0-1.2 m	satd.	(263)
NaBr.....	20			(463)
KBr.....	20			(463)
B = I ₂				
Pb(NO ₃) ₂	20	satd.	satd.	(194)
KI.....	0	satd.	0-0.1 N	(315)
	7.9	satd.	2-13 %	(157)
	25	0-satd.	satd.-0	(474)
B = HI				
NH ₄ I.....	20			(463)
SrCl ₂	25	0-0.8 m	satd.	(263)
NaI.....	20			(463)
KI.....	20			(463)
B = HIO ₃				
HNO ₃	0-60	satd.	28-41 %	(245)
MoO ₃	25			(517)
B = SO ₂				
H ₂ SO ₄	15	satd.	0-96 %	(353)
B = SO ₃				
H ₂ SO ₄	15, 35, 45	100-0 %	0-100 %	(335)
	18			(351)
CrO ₃	25, 45	solid phase present		(230)
B = H ₂ SO ₄				
H ₂ S ₂ O ₈	14	6-33 %	7-35 %	(169)
N ₂ O ₃	15	40-100 %	satd.	(353)
HNO ₃	18	?	?	(410)
	20	series of mixtures		(464)
	3-35	0-100 %	0-100 %	(475, 476)
NH ₄ NO ₃	20			(462, 466)
NH ₄ Cl.....	20			(466)
HSNO ₅	18	70-100 %	0.1 %	(410)
(NH ₄) ₂ SO ₄	15	series of mixtures		(300)
	20			(462, 466)
As ₂ O ₃	18	70-100 %	0.1 %	(410)
PbSO ₄	18	70-100 %	0.1 %	(410)

C	t, °C	Concn. range		Lit.	
		B	C		
B = H ₂ SO ₄ .—(Continued)					
ZnCl ₂	20			(462, 466)	
ZnSO ₄	15	series of mixtures		(300)	
	20			(462, 466)	
Zn(NO ₃) ₂	20			(462, 466)	
CdSO ₄	0	?	satd.	(175)	
CuCl ₂	20			(462, 466)	
CuSO ₄	0	?	satd.	(175)	
	15	series of mixtures		(300)	
	20			(462, 466)	
	25		0-3.7 N	satd.	(234)
	25	9-75 % SO ₃	satd.	(34)	
	25, 40	0-25 %	0-25 %	(299)	
Cu(NO ₃) ₂	20			(462, 466)	
Fe ₂ (SO ₄) ₃	18	70-100 %	0.1 %	(410)	
UO ₂ SO ₄	20-22	d = 1.168	1-5 %	(121)	
U(SO ₄) ₂	17-19	d = 1.14	1-5 %	(119, 121)	
UO ₂ (NO ₃) ₂	11-12	d = 1.138	1-5 %	(120, 124)	
Al ₂ (SO ₄) ₃	15	series of mixtures		(300)	
	18		70-100 %	0.1 %	(410)
MgCl ₂	20			(462, 466)	
MgSO ₄	15	series of mixtures		(300)	
	18		70-100 %	0.1 %	(410)
	20			(462, 466)	
Mg(NO ₃) ₂	20			(462, 466)	
CaSO ₄	18	70-100 %	0.1 %	(410)	
NaCl.....	20			(462, 466)	
Na ₂ SO ₄	0	0.9-2.1 Mol %	1-2.2 Mol %	(105)	
	15	series of mixtures		(300)	
	18		70-100 %	0.1 %	(410)
	20	series of mixtures		(464)	
	20			(462, 466)	
NaNO ₃	20			(462, 466)	
KCl.....	20			(462, 466)	
K ₂ SO ₄	15	series of mixtures		(300)	
	20		several points	(462, 466)	
KNO ₃	20			(462, 466)	
K ₂ Cr ₂ O ₇	25	0.12-1 N	0.12-1 N	(328)	
B = H ₂ SeO ₄					
(NH ₄) ₂ SeO ₄	20			(463)	
Na ₂ SeO ₄	20			(463)	
K ₂ SeO ₄	20			(463)	
B = NH ₃					
NH ₄ NO ₃	25	0.12-1 N	0.12-1 N	(328)	
NH ₄ Cl.....	0	0-17 N	satd.	(179)	
	25	0-4.75 N	1.05 N	(50)	
	25	0.12-1 N	0.12-1 N	(328)	
	15			(101)	
CuSO ₄	15			(303)	
Cu(CNS) ₂	25	0.5-18 m	satd.	(55)	
AgCl.....	15	0.6-10 N	satd.	(55)	
AgBr.....	15.5	1-6 N	satd.	(50)	
CaCl ₂	25	0-6 N	1.09 N	(50)	
LiCl.....	25	0-7.6 N	0.5 and 1.5 N	(50)	
				(50)	
Li ₂ SO ₄	25	0-6.5 N	2.2 N	(195)	
NaNO ₃	15	5.4-7.5 N	satd.	(101)	
KCl.....	15				
B = HNO ₃					
NH ₄ NO ₃	0	?	satd.	(176)	
	20			(463)	
	23			(542, 543)	
(NH ₄) ₂ SO ₄	20			(462, 466)	
Pb(NO ₃) ₂	15			(144)	

C	t, °C	Concn. range		Lit.	C	t, °C	Concn. range		Lit.
		B	C				B	C	
B = HNO ₃ .—(Continued)					B = NH ₄ Cl.—(Continued)				
TiCl ₄	25	0-22 %	satd.	(294, 295)	KCl.....	25	entire range of satd. solutions		(202)
ZnSO ₄	20			(462, 466)		25	0.12-1 N	0.12-1 N	(328)
Zn(NO ₃) ₂	20			(462, 466)	K ₂ SO ₄	15	series of mixtures		(144)
CuSO ₄	20			(462, 466)	B = NH ₄ Br				
Cu(NO ₃) ₂	20			(462, 466)	KBr.....	25	entire range of satd. solutions		(202)
AgIO ₃	25	1-40 %	satd.	(294, 295)	B = (NH ₄) ₂ SO ₄				
Ag ₂ SO ₄	25	0-49 %	satd.	(294, 295)	CuSO ₄	25	0.12-1 N	0.12-1 N	(328)
AgNO ₃	30	0-12.5 N	satd.	(411)	MnSO ₄	25	0.12-1 N	0.12-1 N	(328)
Ag ₂ C ₂ O ₄ , Oxalate.....	25	1.6-31 %	satd.	(294, 295)	FeSO ₄	15			(144)
AgC ₂ H ₃ O ₂ , Acetate.....	25	0-34 %	satd.	(294, 295)	Al ₂ (SO ₄) ₃	25	0.12-1 N	0.12-1 N	(328)
AgC ₂ H ₂ ClO ₂ , Chloro- acetate.....	25	0-27 %	satd.	(294, 295)		25			(517)
UO ₂ (NO ₃) ₂	11-12	d = 1.153	1-5 %	(120, 124)	MgSO ₄	15			(101)
Al(NO ₃) ₃	0-60	5-75 %	satd.	(427)	CaSO ₄	25	0-6 N	satd.	(262, 584)
MgSO ₄	20			(462, 466)		50	0-560 g	satd.	(32)
Mg(NO ₃) ₂	20			(462, 466)	Na ₂ CO ₃	?	?	?	(191)
SrCl ₂	25	0-1.3 m	satd.	(263)	Na ₂ B ₄ O ₇	?	?	?	(191)
Ba(NO ₃) ₂	25	0.12-1 N	0.12-1 N	(328)	K ₂ SO ₄	25	0-satd.	satd.-0	(202)
	30	0-5 N	satd.	(411)		25	0.12-1 N	0.12-1 N	(328)
Na ₂ SO ₄	15, 22	?	?	(652)		25			(517)
	20	series of mixtures		(464)	(NH ₄) ₃ PO ₄	20			(463)
	20			(462, 466)	FePO ₄	25	1-24 % P ₂ O ₅	satd.	(93)
NaHSO ₄	15, 22	?	?	(652)	MoO ₃	25			(517)
NaNO ₃	0	?	satd.	(176)	MgHPO ₄	25	7.3-835 g P ₂ O ₅	satd.	(93)
	15, 22	?	?	(652)					
	20			(463)	Na ₂ SO ₄	15			(144)
	20	series of mixtures		(464)	Na ₃ PO ₄	20			(463)
NaC ₂ HCl ₂ O ₂ , Dichloro- acetate.....	20			(463)	KOH.....	12-12.5	0-6 N	2-0 N	(133)
K ₂ SO ₄	20			(462, 466)	K ₃ PO ₄	20			(463)
KNO ₃	0	?	satd.	(176)	B = (NH ₄) ₂ HPO ₄				
	20			(463)	KMnO ₄	15			(144)
KC ₂ HCl ₂ O ₂ , Dichloro- acetate.....	20			(463)	B = H ₃ AsO ₄				
B = NH ₄ OH					(NH ₄) ₃ AsO ₄	20			(463)
NaOH.....	15			(144)	MoO ₃	25			(517)
B = NH ₄ NO ₃					CaO.....	35			(568)
NH ₄ Cl.....	23			(542, 543)	Na ₃ AsO ₄	20			(463)
	25	0.12-1 N	0.12-1 N	(328)	K ₃ AsO ₄	20			(463)
Ba(NO ₃) ₂	25	0.12-1 N	0.12-1 N	(328)	B = PbO				
NaNO ₃	0, 15, 30	0-satd.	0-satd.	(195)	PbC ₄ H ₆ O ₄ , Acetate.....	25	phase rule study		(310)
	25	0.12-1 N	0.12-1 N	(328)			B = PbCl ₂		
NaHCO ₃	15			(144)	Pb(NO ₃) ₂	25	satd.	0.02-0.1 N	(262)
KNO ₃	23			(542, 543)	K ₂ SO ₄	22	satd.		(75)
	25	0.12-1 N	0.12-1 N	(328)	SrS ₂ O ₆	25	0-satd.	satd.-0	(202)
B = NH ₄ Cl					B = Pb(NO ₃) ₂				
MnCl ₂	25	0-29 %	0-44 %	(113)	Cu(NO ₃) ₂	20	satd.	0-satd.	(194)
	60	0-33 %	3-50 %	(113)	Sr(NO ₃) ₂	25	0-satd.	satd.-0	(202)
FeCl ₃	25	0.12-1 N	0.12-1 N	(328)	Ba(NO ₃) ₂	17			(183)
BaCl ₂	25	0.12-1 N	0.12-1 N	(328)		25	0-satd.	satd.-0	(202)
NaCl.....	0-5			(227)	NaNO ₃	25	0.12-1 N	0.12-1 N	(328)
	0	0-satd.	satd.-0	(193)	KNO ₃	25	0.12-1 N	0.12-1 N	(328)
	15	0-satd.	satd.-0	(193)	B = PbC ₂ H ₂ O ₄ , Formate				
	30	1-5 N	2-4 N	(38)	BaC ₂ H ₂ O ₄ , Formate.....	25	satd.-0	0-satd.	(202)
KCl.....	0-5	satd.	satd.	(193)			B = PbC ₄ H ₆ O ₄ , Acetate		
				(227)	NaNO ₃	15			(144)
					B = TiNO ₃				
					KNO ₃	25	0-satd.	satd.-0	(202)

C	<i>t</i> , °C	Concn. range		Lit.
		B	C	
B = ZnCl ₂				
NaI.....	15			(144)
B = ZnSO ₄				
MnSO ₄	15			(144)
K ₂ SO ₄	18			(604)
B = CdCl ₂				
KCN.....	25			(517)
B = CdSO ₄				
Na ₂ SO ₄	16			(550)
B = HgCl ₂				
NaCl.....	16			(550)
KCl.....	20	several mixtures complete range		(601)
	34, 56, 80,			(601)
	100			
KI.....	25			(517)
KCN.....	25			(517)
B = HgI ₂				
KI.....	16			(550)
B = CuO				
CuCl ₂	18			(604)
CuSO ₄	25	satd.	1.2-8.7 % Cu	(34)
B = CuCl ₂				
MgCl ₂	25			(659)
SrCl ₂	25	0-2.3 <i>m</i>	satd.	(263)
LiCl.....	25	several points		(659)
NaCl.....	18			(604)
	25			(659)
KCl.....	18			(604)
	25			(659)
B = CuSO ₄				
MnSO ₄	25	0.12-1 <i>N</i>	0.12-1 <i>N</i>	(328)
CaSO ₄	25	0-225 g	satd.	(33)
	25	0-13.5 %	satd.	(264)
Na ₂ SO ₄	25	0.12-1 <i>N</i>	0.12-1 <i>N</i>	(328)
K ₂ SO ₄	18	0.04-0.5 <i>m</i>	0.04-0.5 <i>m</i>	(11)
	18			(604)
	25	0.12-1 <i>N</i>	0.12-1 <i>N</i>	(328)
B = Ag ₂ SO ₄				
AgNO ₃	25	satd.	0.025-0.1 <i>N</i>	(262)
AgC ₂ H ₃ O ₂ , Acetate.....	17			(183)
MgSO ₄	25	satd.	0.02-0.2 <i>N</i>	(262)
Mg(NO ₃) ₂	25	satd.	0.025-0.1 <i>N</i>	(262)
CaSO ₄	17, 25			(183)
K ₂ SO ₄	25	satd.	0.025-0.2 <i>N</i>	(262)
KNO ₃	25	satd.	0.025-0.1 <i>N</i>	(262)
B = AgNO ₃				
LiNO ₃	25			(517)
KCN.....	25			(517)
B = MnSO ₄				
Na ₂ SO ₄	16			(550)
	25	0.12-1 <i>N</i>	0.12-1 <i>N</i>	(328)
K ₂ SO ₄	25	0.12-1 <i>N</i>	0.12-1 <i>N</i>	(328)
B = FeCl ₃				
MgSO ₄	15			(144)
B = Fe(NH ₄) ₂ (SO ₄) ₂				
AlCl ₃	15			(144)
B = CoCl ₂				
MgCl ₂	25			(659)
LiCl.....	25	several points		(659)

C	<i>t</i> , °C	Concn. range		Lit.
		B	C	
B = CoCl ₂ .—(Continued)				
NaCl.....	18			(604)
	25	several points		(659)
KCl.....	18			(604)
	25	several points		(659)
B = NiSO ₄				
K ₂ CrO ₄	15			(144)
B = H ₂ CrO ₄				
(NH ₄) ₂ CrO ₄	20			(463)
MoO ₃	25			(517)
Na ₂ CrO ₄	20			(463)
K ₂ CrO ₄	20			(463)
B = Al ₂ (SO ₄) ₃				
Na ₂ SO ₄	25	0.12-1 <i>N</i>	0.12-1 <i>N</i>	(328)
K ₂ SO ₄	25			(517)
B = La(IO ₃) ₃				
La(NO ₃) ₃	25	satd.	0-0.2 <i>N</i>	(265)
La(NO ₃) ₃ · 2NH ₄ NO ₃	25	satd.	0-1.6 <i>N</i>	(265)
NaIO ₃	25	satd.	0-0.007 <i>N</i>	(265)
NaNO ₃	25	satd.	0-3 <i>N</i>	(265)
KIO ₃	25	satd.	0-0.002 <i>N</i>	(265)
B = MgCl ₂				
K ₂ Cr ₂ O ₇	15			(144)
B = MgSO ₄				
CaSO ₄	25	0-satd.	satd.	(92)
	25	0-0.18 %	satd.	(264)
Na ₂ SO ₄	16			(550)
K ₂ SO ₄	18	0-1 <i>N</i>	0-1 <i>N</i>	(415)
B = Mg(NO ₃) ₂				
CaSO ₄	25	0-514 g	satd.	(560)
Ba(BrO ₃) ₂	25			(262)
B = Ca(OH) ₂				
Ca(NO ₃) ₂	25	satd.	30-920 g	(96)
B = CaCl ₂				
Ca(OCl) ₂	15	0-72 g available Cl		(389)
NaCl.....	25	0-satd.	satd.	(94)
	25	satd.	0-satd.	(94)
B = CaSO ₄				
Ca(NO ₃) ₂	25	satd.	0-544 g	(560)
	25	satd.	0-0.6 <i>N</i>	(262)
Na ₂ SO ₄	25	satd.	20-2570 g	(95)
	25	satd.	0.03-3.6 <i>N</i>	(262)
NaNO ₃	25	satd.	0-655 g	(560)
K ₂ SO ₄	25	satd.	0.06-0.35 <i>N</i>	(262)
	25	satd.	50-960 g	(95)
KNO ₃	25	satd.	0-1 %	(264)
	25	satd.	0-260 g	(560)
B = CaCO ₃				
NaCl.....	25	satd.	20-300 g	(94)
Na ₂ SO ₄	25	satd.	10-240 g	(94)
KCl.....	25	satd.	0-26 %	(97)
K ₂ SO ₄	25	satd.	0-11 %	(97)
B = Sr(OH) ₂				
Sr(NO ₃) ₂	25	0-satd.	satd.-0	(473)
B = SrCl ₂				
Sr(NO ₃) ₂	25	satd.	0-3.3 <i>m</i>	(263)
NaNO ₃	25	satd.	0-6.9 <i>m</i>	(263)
KCl.....	25	satd.	0-1.6 <i>m</i>	(263)
KI.....	25	satd.	0-1.5 <i>m</i>	(263)
KNO ₃	25	satd.	0-0.5 <i>m</i>	(263)
B = SrBr ₂				
Sr(NO ₃) ₂	25	satd.	0-1.9 <i>m</i>	(266)

C	t, °C	Concn. range		Lit.
		B	C	
B = Sr(NO ₃) ₂				
NaNO ₃	25	0.12-1 N	0.12-1 N	(328)
KNO ₃	25	0.12-1 N	0.12-1 N	(328)
B = Ba(OH) ₂				
Ba(NO ₃) ₂	25	0-satd.	satd.-0	(472)
B = BaCl ₂				
Ba(NO ₃) ₂	25	0.12-1 N	0.12-1 N	(328)
NaCl.....	15	1-3 N	1-3 N	(38)
	25	0.12-1 N	0.12-1 N	(328)
NaC ₂ H ₃ O ₂ , Acetate.....	15			(144)
KCl.....	15	1-3 N	1-3 N	(38)
	25	0.12-1 N	0.12-1 N	(328)
B = Ba(BrO ₃) ₂				
Ba(NO ₃) ₂	25	satd.	0.025-0.2 N	(262)
KBrO ₃	25	satd.	0.025-0.1 N	(262)
KNO ₃	25	satd.	0.025-0.1 N	(262)
B = Ba(NO ₃) ₂				
NaNO ₃	25	0.12-1 N	0.12-1 N	(328)
KNO ₃	17			(183)
	25	0.12-1 N	0.12-1 N	(328)
	30			(183)
B = LiCl				
NaCl.....	15	1-6 N	2-4 N	(38)
B = NaOH				
NaCl.....	0	?	satd.	(180)
	0	0-5 N	satd.	(179)
	0-55	30-200 g	75-230 g	(145)
	20	10-320 g	satd.	(647)
	20	0-60 %	26.4-0.8 %	(302)
	60	0-60 %	27-1.5 %	(302)
	100	0-60 %	28-3 %	(302)
NaNO ₃	0	0-6 N	satd.	(179)
Na ₂ CO ₃	11.5, 60, 80	series of mixtures		(639)
NaC ₁₆ H ₃₁ O ₂ , Palmitate....	90	series of mixtures		(134)
Na ₂ SiO ₃	17.5			(625)
KOH.....	25	0.12-1 N	0.12-1 N	(328)
B = NaCl				
NaClO ₃	20	5-150 g	satd.	(647)
Na ₂ SO ₄	20	series of mixtures		(464)
	25	0-320 g	0-270 g	(94)
NaNO ₃	15	0-190 g	satd.	(54)
	15.5	satd.	0-380 g	(54)
	19.5	series of measurements		(362)
	20	satd.	satd.	(450)
	25	0.12-1 N	0.12-1 N	(328)
NaHCO ₃	0	0-6 m	satd.	(193)
	0	satd.	0-0.09 m	(193)
	15	0-6 m	satd.	(193)
	15	satd.	0-0.12 m	(193)
	30	0-6 m	satd.	(193)
	30	satd.	0-0.17 m	(193)
	45	0-6 m	satd.	(193)
	45	satd.	0-0.23 m	(193)
Na ₂ SiO ₃	17.5			(625)
KCl.....	0	2.9-6.2 Mol %	0.4-3.3 Mol %	(105)
	0-5			(227)
	15	0.25-4 N	0.2-3.5 N	(37)
	15.6	satd.	satd.	(470)

C	t, °C	Concn. range		Lit.
		B	C	
B = NaCl.—(Continued)				
KCl.....	18	0-1 N	1-0 N	(59)
	19.5	series of mixtures		(362)
	20	satd.	satd.	(450)
	25	0.12-1 N	0.12-1 N	(328)
	25			(517, 576)
K ₂ SO ₄	15.6	satd.	satd.	(470)
	18	range of concentrations		(11)
KNO ₃	15	0.25-120 g	0.25-120 g	(144)
	15.6	satd.	satd.	(470)
	19.5	series of mixtures		(362)
B = NaBr				
KBr.....	25			(576)
K ₂ C ₂ O ₄ , Oxalate.....	15			(144)
B = NaI				
KI.....	25			(576)
B = Na ₂ SO ₃				
Na ₂ SO ₄	0.1	3-12 %	1-3 %	(107)
	17.5	2.6-19 %	2-12 %	(107)
	25	2.5-27 %	1.7-21 %	(107)
	37.5	2.6-28 %	2-30 %	(107)
B = Na ₂ SO ₄				
NaNO ₃	16			(422)
	20	series of mixtures		(464)
Na ₂ CO ₃	20			(585)
KCl.....	15			(297)
K ₂ SO ₄	18	0.05-0.7 m	0.025-0.5 m	(11)
	25	0.12-1 N	0.12-1 N	(328)
KNO ₃	16	20-70 g	50-140 g	(422)
KMnO ₄	25	0-22 %	satd.	(603)
NaNO ₃	18	satd.	satd.	(467)
	B = NaNO ₃			
NaHCO ₃	0, 15	0-satd.	0-satd.	(195)
K ₂ SO ₄	15	30-100 g	30-100 g	(422)
KNO ₃	15.6	satd.	satd.	(470)
	16	0-140 g	0-140 g	(422)
	20	satd.	satd.	(450)
	25	0.12-1 N	0.12-1 N	(328)
B = Na ₂ CO ₃				
KOH.....	15			(144)
K ₂ CO ₃	25	0.12-1 N	0.12-1 N	(328)
B = Na ₄ SiO ₄				
Na ₂ WO ₄	30	series of mixtures		(383)
B = Na ₄ Fe(CN) ₆				
K ₄ Fe(CN) ₆	25	0-1 m	satd.	(266)
	25	satd.	0-1 m	(266)
B = KOH				
KCl.....	0	0-3.5 N	satd.	(179)
	20	10-430 g	satd.	(647)
K ₂ S.....	0-80	25-200 g	70-210 g	(314)
	8-18	4-55 % solutes	Mol ratio 1:1	(52)
B = KCl				
KClO ₃	20	0-120 g	satd.	(647)
KBr.....	25	0-satd.	satd.-0	(202)
KI.....	19.5			(84)
K ₂ SO ₄	18	0.48-0.025 N	0.05-0.3 N	(22)
KNO ₃	17.5	satd.	0-153 g	(54)
	20	satd.	satd.	(450)
	20.5	0-250 g	satd.	(54)
	25	0.12-1 N	0.12-1 N	(328)

C	$t, ^\circ\text{C}$	Concn. range		Lit.
		B	C	
B = KCl .—(Continued)				
$\text{K}_2\text{Al}_2(\text{SO}_4)_4 \dots$	15			(144)
B = KBr				
$\text{CuC}_4\text{H}_6\text{O}_4$, Acetate.....	15			(144)
B = KI				
$\text{KCN} \dots \dots \dots$	25			(517)
B = K_2S				
$\text{KHS} \dots \dots \dots$	8–18	3–52 % solutes	Mol ratio 1:1	(52)

C	$t, ^\circ\text{C}$	Concn. range		Lit.
		B	C	
B = K_2SO_4				
$\text{KHSO}_4 \dots \dots \dots$	15	series of mixtures		(300)
$\text{KNO}_3 \dots \dots \dots$	15			(183)
	18	66–73 g	42–29 g	(422)
	25			(183)
$\text{K}_2\text{CO}_3 \dots \dots \dots$	20			(585)
$\text{KMnO}_4 \dots \dots \dots$	25	0–11 %	satd.	(603)
$\text{K}_2\text{CrO}_4 \dots \dots \dots$	15			(101)
	25	0–satd.	satd.–0	(202)
$\text{K}_2\text{Cr}_2\text{O}_7 \dots \dots \dots$	25	0.12–1 N	0.12–1 N	(328)
B = K_2HPO_4				
$\text{K}_2\text{CO}_3 \dots \dots \dots$	15			(144)

Three or More Solutes

H₂O

THREE SOLUTES

B	C	D	$t, ^\circ\text{C}$	Concn. range			Lit.
				B	C	D	
HCl	H ₂ SO ₄	Na ₂ SO ₄	20	series of mixtures			(464)
	NaCl	KCl	25	0–4 m	0–4 m	0–1.5 m	(527)
I ₂	PbI ₂	Pb(NO ₃) ₂	20	all satd.			(194)
H ₂ SO ₄	HNO ₃	Na ₂ SO ₄	20	series of mixtures			(464)
	La ₂ (SO ₄) ₃	La ₂ C ₆ O ₁₂ , Oxalate	25	4–4.6 M	satd.	satd.	(651)
NH ₃	NH ₄ NO ₃	NaNO ₃	15				(195)
HNO ₃	Na ₂ SO ₄	NaNO ₃	20	series of mixtures			(464)
NH ₄ NO ₃	NH ₄ HCO ₃	NaHCO ₃	0, 15	all satd.			(195)
	NaNO ₃	NaHCO ₃	0, 15	all satd.			(195)
			15	satd.	1.9–3.4 N	satd.	(195)
NH ₄ Cl	CuSO ₄	K ₂ SO ₄	15	series of mixtures			(144)
	NaCl	KCl	0–5				(227)
(NH ₄) ₂ SO ₄	NaNO ₃	KCl	?	?	?	?	(191)
Tl ₂ SO ₄	Al ₂ (SO ₄) ₃	K ₂ SO ₄	25	0–satd.	0–satd.	0–satd.	(202)
CaSO ₄	NaCl	Na ₂ SO ₄	25	0.3–6 g	0–310 g	0–260 g	(94)
CaCO ₃	NaCl	Na ₂ SO ₄	25	satd.	0–320 g	0–270 g	(94)
BaSO ₄	K ₂ SO ₄	K ₂ CO ₃	25	equilibrium mixtures			(424)
NaCl	NaNO ₃	KNO ₃	15.6	satd.	satd.	satd.	(470)
	KCl	K ₂ SO ₄	15.6	satd.	satd.	satd.	(470)
	KCl	KNO ₃	15.6	satd.	satd.	satd.	(470)
	KI	KNO ₃	15	series of mixtures			(144)

FOUR SOLUTES

B	C	D	E	$t, ^\circ\text{C}$	Concn. range				Lit.
					B	C	D	E	
I ₂	PbI ₂	Pb(NO ₃) ₂	Cu(NO ₃) ₂	20	satd.	satd.	0.14–0.8 N	1–3.4 N	(194)

SEA WATER [JAB] (339)**; α (81)*; (292, 408.5), α (153, 168, 380, 408, 445, 597)

% Cl	% total salts	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
0.1	0.184	1.00140	1.00149	1.00120	1.00058	0.99966	0.99849	0.99708	0.99545
0.2	0.364	1.00287	1.00293	1.00261	1.00197	1.00104	0.99985	0.99842	0.99678
0.3	0.545	1.00433	1.00436	1.00402	1.00335	1.00241	1.00120	0.99976	0.99811
0.4	0.725	1.00579	1.00579	1.00542	1.00474	1.00377	1.00256	1.00110	0.99944
0.5	0.906	1.00725	1.00722	1.00683	1.00612	1.00514	1.00391	1.00245	1.00077
0.6	1.086	1.00871	1.00865	1.00823	1.00751	1.00651	1.00526	1.00379	1.00210
0.7	1.267	1.01016	1.01007	1.00963	1.00889	1.00787	1.00661	1.00513	1.00343
0.8	1.447	1.01162	1.01150	1.01103	1.01027	1.00924	1.00796	1.00647	1.00476
0.9	1.628	1.01307	1.01292	1.01243	1.01165	1.01060	1.00931	1.00780	1.00608
1.0	1.808	1.01452	1.01434	1.01383	1.01303	1.01196	1.01066	1.00914	1.00741
1.1	1.989	1.01597	1.01577	1.01523	1.01441	1.01333	1.01201	1.01048	1.00874
1.2	2.169	1.01742	1.01719	1.01663	1.01579	1.01469	1.01336	1.01182	1.01007
1.3	2.350	1.01887	1.01861	1.01803	1.01717	1.01605	1.01472	1.01316	1.01140
1.4	2.530	1.02032	1.02003	1.01943	1.01855	1.01742	1.01607	1.01450	1.01274
1.5	2.711	1.02177	1.02146	1.02083	1.01993	1.01879	1.01742	1.01585	1.01407

SEA WATER.—(Continued)

% Cl	% total salts	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
1.6	2.891	1.02322	1.02288	1.02223	1.02131	1.02016	1.01878	1.01720	1.01541
1.7	3.072	1.02468	1.02431	1.02364	1.02270	1.02153	1.02014	1.01855	1.01675
1.8	3.252	1.02613	1.02574	1.02504	1.02408	1.02290	1.02150	1.01989	1.01809
1.9	3.433	1.02758	1.02716	1.02644	1.02547	1.02427	1.02286	1.02124	1.01944
2.0	3.613	1.02904	1.02859	1.02785	1.02686	1.02564	1.02422	1.02260	1.02079
2.1	3.794	1.03049	1.03002	1.02926	1.02825	1.02701	1.02558	1.02395	1.02214
2.2	3.974	1.03195	1.03145	1.03067	1.02964	1.02839	1.02695	1.02531	1.02349
2.3	4.155	1.03341	1.03289	1.03208	1.03104	1.02978	1.02831	1.02667	1.02484

C-TABLE, THE C-ARRANGEMENT

Two Solutes in H₂O*t* = 20° (463)

Formula..... Name

B = CH₂O₂, Formic acid

CH ₃ NO ₂	NH ₄ Formate
C ₂ H ₇ NO ₃	NH ₄ Glycolate
C ₃ H ₉ NO ₂	NH ₄ Propionate
C ₃ H ₉ NO ₃	NH ₄ Lactate
C ₄ H ₁₁ NO ₂	NH ₄ Butyrate
C ₄ H ₁₁ NO ₃	NH ₄ Isobutyrate
C ₄ H ₁₂ N ₂ O ₄	NH ₄ Succinate
C ₄ H ₁₂ N ₂ O ₅	NH ₄ Malate

B = CH₃NO₂, Ammonium formate

C ₂ HCl ₃ O ₂	Trichloroacetic acid
C ₂ H ₄ O ₂	Acetic acid
C ₃ H ₆ O ₃	Lactic acid
C ₄ H ₈ O ₂	Butyric acid
C ₄ H ₈ O ₃	Isobutyric acid

B = C₂HCl₃O₂, Trichloroacetic acid

C ₂ H ₄ Cl ₃ NO ₂	NH ₄ Trichloroacetate
C ₂ H ₅ Cl ₂ NO ₂	NH ₄ Dichloroacetate
C ₂ H ₆ ClNO ₂	NH ₄ Chloroacetate

B = C₂H₂Cl₂O₂, Dichloroacetic acid

C ₂ H ₅ Cl ₂ NO ₂	NH ₄ Dichloroacetate
C ₃ H ₉ NO ₃	NH ₄ Lactate

B = C₂H₃ClO₂, Chloroacetic acid

C ₂ H ₄ Cl ₃ NO ₂	NH ₄ Trichloroacetate
C ₂ H ₆ ClNO ₂	NH ₄ Chloroacetate

B = C₂H₄O₂, Acetic acid

C ₂ H ₇ NO ₂	NH ₄ Acetate
C ₄ H ₁₁ NO ₂	NH ₄ Butyrate
C ₄ H ₁₁ NO ₃	NH ₄ Isobutyrate

B = C₂H₅Cl₂NO₂, NH₄ Dichloroacetate

C ₃ H ₆ O ₃	Lactic acid
--	-------------

B = C₂H₅O, Ethyl alcohol

C ₇ H ₉ NO ₂ *.....	NH ₄ Benzoate
C ₇ H ₉ NO ₃ †.....	NH ₄ Salicylate

B = C₂H₇NO₂, NH₄ Acetate

C ₄ H ₈ O ₂	Butyric acid
C ₄ H ₈ O ₃	Isobutyric acid

B = C₃H₆O₂, Propionic acid

C ₃ H ₉ NO ₂	NH ₄ Propionate
---	----------------------------

B = C₃H₆O₃, Lactic acid

C ₃ H ₉ NO ₃	NH ₄ Lactate
---	-------------------------

B = C₄H₆O₄, Succinic acid

C ₄ H ₁₂ N ₂ O ₄	NH ₄ Succinate
--	---------------------------

B = C₄H₆O₅, Malic acid

C ₄ H ₁₂ N ₂ O ₅	NH ₄ Malate
--	------------------------

B = C₄H₈O₂, Butyric acid

C ₄ H ₁₁ NO ₂	NH ₄ Butyrate
--	--------------------------

B = C₄H₈O₃, Isobutyric acid

C ₄ H ₁₁ NO ₃	NH ₄ Isobutyrate
--	-----------------------------

B = C₆H₈O₇, Citric acid

C ₆ H ₁₇ N ₃ O ₇	NH ₄ Citrate
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* At 25° C, B concn. = 0–100 %, C concn. = satd. (559).

† At 25° C, B concn. = entire range, C concn. = satd. (559).

THE KEY FORMULA OF AT LEAST ONE SOLUTE (THE B-SOLUTE) DOES NOT BEGIN WITH 16

Two Solutes in H₂O

The B-solute in Standard Arrangement, the C-solute in the C-arrangement

C		<i>t</i> , °C	Concn. range		Lit.
Formula	Name		B	C	
B = HCl					
C ₂ H ₂ Cl ₂ O ₂	Dichloroacetic acid	25	0.12–1N	0.12–1N	(328)
C ₂ H ₂ O ₄	Oxalic acid	30	0–9.7 N	satd.	(412)
C ₂ H ₄ O ₂	Acetic acid	25	0.12–1 N	0.12–1 N	(328)
C ₂ H ₅ Cl ₂ NO ₂	NH ₄ Dichloroacetate	20			(463)
C ₂ H ₆ O	Ethyl alcohol	25	0.3–3.2 N	100 %–?	(324)
C ₆ H ₇ N	Aniline	25	range of concn.		(562)
C ₆ H ₁₂ O ₄	Invert sugar	25			(56)
C ₈ H ₆ O ₄	Phthalic acid	25	0.2–1.9 m	satd.	(518)
C ₁₀ H ₈ O ₃ S	β-Naphthalene-sulfonic acid	30	0–9.9 N	satd.	(412)
C ₁₂ H ₂₂ O ₁₁	Sucrose	0, 25			(56)
B = I ₂					
C ₃ H ₈ O ₃	Glycerol	25	satd.	0–100 %	(283)
B = S					
C ₃ H ₆ O	Acetone	25	satd.	85–100 %	(283)
B = H ₂ SO ₄					
C ₂ H ₂ O ₄	Oxalic acid	25	0–8.4 N	satd.	(651)
C ₄ H ₆ O ₅	Malic acid	20	2.5–11 %	6–7 %	(546)
C ₄ H ₁₀ O	Ethyl ether	30	50–100 %	entire range	(495)

C		<i>t</i> , °C	Concn. range		Lit.
Formula	Name		B	C	
B = HNO ₃					
C ₂ H ₂ O ₄	Oxalic acid	30	0-21.6 <i>N</i>	satd.	(412)
C ₂ H ₄ O ₂	Acetic acid	25	0.12-1 <i>N</i>	0.12-1 <i>N</i>	(328)
C ₂ H ₅ Cl ₂ NO ₂	NH ₄ Dichloro- acetate	20			(463)
C ₁₅ H ₃₂ O ₁₆	Raffinose	25			(232)
B = NH ₄ NO ₃					
NH ₄ HCO ₃		15	0-satd.	0-satd.	(195)
C ₈ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = NH ₄ Cl					
NH ₄ HCO ₃		0	0-5.4 <i>m</i>	satd.	(193)
			satd.	0-0.46 <i>m</i>	(193)
		15	0-6.4 <i>m</i>	satd.	(193)
			satd.	0-0.81 <i>m</i>	(193)
C ₃ H ₆ O	Acetone	25	satd.	0-90 Vol. %	(283)
C ₃ H ₈ O ₃	Glycerol	25	satd.	0-100 %	(283)
C ₈ H ₆ O ₄	Phthalic acid	25	0.06-1.9 <i>m</i>	satd.	(518)
C ₇ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = (NH ₄) ₂ SO ₄					
C ₂ H ₆ O	Ethyl alcohol	9	satd.	0-142 g	(53)
		15	satd.	entire system	(53)
C ₈ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = PbC ₄ H ₆ O ₄ , Acetate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(559)

C		t, °C	Concn. range		Lit.
Formula	Name		B	C	
B = ZnC ₄ H ₆ O ₄ , Acetate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(559)
B = ZnC ₁₀ H ₁₈ O ₄ , Valerate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	entire range	(559)
B = ZnC ₁₂ H ₁₀ O ₃ S ₂ , p-Phenolsulfonate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	entire range	(559)
B = HgCl ₂					
CH ₄ O	Methyl alcohol	25	satd.	0-100 %	(280)
C ₂ H ₆ O	Ethyl alcohol	20	satd.	0-100 %	(280)
C ₄ H ₈ O ₂	Ethyl acetate	25	satd.	0-100 %	(280)
B = HgBr ₂					
CH ₄ O	Methyl alcohol	25	satd.	0-100 %	(280)
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(280)
C ₄ H ₈ O ₂	Ethyl acetate	25	satd.	0-100 %	(280)
B = HgI ₂					
CH ₄ O	Methyl alcohol	25	satd.	47-100 %	(280)
C ₂ H ₆ O	Ethyl alcohol	25	satd.	67-100 %	(283)
			satd.	70-100 %	(280)
C ₄ H ₈ O ₂	Ethyl acetate	25	satd.	0-100 %	(280)
B = Hg(CN) ₂					
CH ₄ O	Methyl alcohol	25	satd.	0-100 %	(280)
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(280)
C ₄ H ₈ O ₂	Ethyl acetate	25	satd.	0-100 %	(280)
C ₈ H ₆ O ₄	Phthalic acid	25	0.06-0.8 m	satd.	(518)
B = CuC ₂ H ₃ O ₄ , Formate					
CH ₂ O ₂	Formic acid	?			(563)
B = CuC ₄ H ₅ O ₄ , Acetate					
C ₂ H ₄ O ₂	Acetic acid	?			(563)
B = CuC ₆ H ₁₀ O ₄ , Propionate					
C ₃ H ₆ O ₂	Propionic acid	?			(563)
B = AgClO ₄					
C ₆ H ₆	Benzene			complete study	(293)
B = MoO ₃					
C ₂ H ₂ O ₄	Oxalic acid				(517)
C ₂ H ₄ O ₂	Acetic acid	25			(517)
C ₂ H ₄ O ₃	Glycolic acid	25			(517)
C ₃ H ₆ O ₂	Propionic acid	25			(517)
C ₃ H ₆ O ₃	Lactic acid	25			(517)
C ₄ H ₆ O ₄	Succinic acid	25			(517)
C ₄ H ₆ O ₅	Malic acid	25			(517)
C ₄ H ₆ O ₆	Tartaric acid	25			(517)
C ₆ H ₈ O ₇	Citric acid	25			(517)
C ₇ H ₁₂ O ₆	Quinic acid	25			(517)
C ₈ H ₈ O ₂	Phenylacetic acid	25			(517)
C ₈ H ₈ O ₃	Mandelic acid	25			(517)
B = (NH ₄) ₆ Mo ₇ O ₂₄					
C ₄ H ₆ O ₆	Tartaric acid	25			(135, 517)
B = UO ₂ (NO ₃) ₂					
C ₂ H ₄ O ₂	Acetic acid	10-17	1-7 %	d = 1.055	(124)
B = H ₃ BO ₃					
CH ₄ O	Methyl alcohol	25	satd.	12-100 Mol %	(437)
C ₂ H ₆ O	Ethyl alcohol	25	satd.	9-100 Mol %	(437)
C ₃ H ₈ O ₃	Lactic acid	25	satd.	2-36 Mol %	(437)
C ₃ H ₈ O	n-Propyl alcohol	25	satd.	24-100 Mol %	(437)
C ₃ H ₈ O ₃	Glycerol	25	satd.	25-91 Mol %	(437)
				0-100 %	(283)
C ₄ H ₁₀ O	Isobutyl alcohol	25	satd.	0.7-	(437)
				100 Mol %	
C ₅ H ₁₂ O	Amyl alcohol	25	satd.	?	(437)
C ₅ H ₁₂ O	Isoamyl alcohol	25	satd.	0.5-	(437)
				100 Mol %	
C ₆ H ₁₄ O ₆	Mannitol	25	satd.	0.8-	(437)
				1.6 Mol %	
C ₆ H ₁₄ O ₆	Dulcitol	25	satd.	0.07-	(437)
				0.3 Mol %	
B = MgCl ₂					
C ₈ H ₆ O ₄	Phthalic acid	25	0.12-2.6 m	satd.	(518)
B = CaCl ₂					
C ₈ H ₆ O ₄	Phthalic acid	25	0.08-0.6 m	satd.	(518)
B = Ca(NO ₃) ₂					
C ₂ H ₆ O	Ethyl alcohol	25	0-5 N	0-100 %	(436)
B = SrC ₁₄ H ₁₀ O ₆ , Salicylate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	entire range	(559)
B = Ba(OH) ₂					
C ₃ H ₈ O	Acetone	25	satd.	0-70 %	(282)
B = BaCl ₂					
C ₈ H ₆ O ₄	Phthalic acid	25	0.1-1.4 m	satd.	(518)
C ₈ H ₁₄ O ₆	Ethyl tartrate	26			(479)

C		t, °C	Concn. range		Lit.
Formula	Name		B	C	
B = LiCl					
C ₈ H ₆ O ₄	Phthalic acid	25	0.1-1.7 m	satd.	(518)
C ₁₂ H ₂₂ O ₁₁	Sucrose	25			(240)
B = LiC ₇ H ₅ O ₂ , Benzoate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(559)
B = LiC ₇ H ₅ O ₃ , Salicylate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	entire range	(559)
B = Li ₃ C ₆ H ₅ O ₇ , Citrate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(559)
B = NaCl					
C ₂ H ₆ O	Ethyl alcohol	11.5-13	satd.	0-720 g	(53)
C ₃ H ₈ O ₃	Glycerol	25	satd.	0-100 %	(283)
C ₅ H ₁₂ O	Amyl alcohol	25	equil. with	0-5 N B in A	(437)
C ₈ H ₆ O ₄	Phthalic acid	25	0.1-3 m	satd.	(518)
C ₈ H ₁₄ O ₆	Ethyl tartrate	26			(479)
C ₁₂ H ₂₂ O ₁₁	Sucrose	20	?	?	(51)
B = NaClO ₃					
C ₈ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = NaI					
C ₈ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = Na ₂ SO ₄					
C ₈ H ₆ O ₄	Phthalic acid	25	0.1-3.0 m	satd.	(518)
B = NaNO ₃					
C ₂ H ₆ O	Ethyl alcohol	13-16.5	satd.	0-630 g	(53)
C ₈ H ₆ O ₄	Phthalic acid	25, 35	0.2-3.0 m	satd.	(518)
C ₈ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = NaCHO ₂ , Formate					
CH ₂ O ₂	Formic acid	20			(463)
C ₂ HCl ₃ O ₂	Trichloroacetic acid	20			(463)
C ₂ H ₄ O ₂	Acetic acid	20			(463)
C ₃ H ₆ O ₃	Lactic acid	20			(463)
C ₄ H ₈ O ₂	Butyric acid	20			(463)
C ₄ H ₈ O ₂	Isobutyric acid	20			(463)
B = NaHCO ₃					
NH ₄ HCO ₃		0	satd.-0	0-satd.	(193)
		15	satd.-0	0-satd.	(193)
			0-satd.	0-satd.	(195)
B = NaC ₂ H ₃ O ₂ , Acetate					
C ₂ H ₄ O ₂	Acetic acid	20			(463)
		25	0.12-1 N	0.12-1 N	(328)
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(559)
C ₄ H ₈ O ₂	Butyric acid	20			(463)
C ₄ H ₈ O ₂	Isobutyric acid	20			(463)
C ₈ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = NaC ₂ H ₃ O ₃ , Glycolate					
CH ₂ O ₂	Formic acid	20			(463)
B = NaC ₃ H ₅ O ₂ , Propionate					
CH ₂ O ₂	Formic acid	20			(463)
C ₃ H ₆ O ₂	Propionic acid	20			(463)
B = NaC ₃ H ₅ O ₃ , Lactate					
CH ₂ O ₂	Formic acid	20			(463)
C ₂ H ₂ Cl ₂ O ₂	Dichloroacetic acid	20			(463)
C ₃ H ₆ O ₃	Lactic acid	20			(463)
B = NaC ₄ H ₇ O ₂ , Butyrate					
CH ₂ O ₂	Formic acid	20			(463)
C ₂ H ₄ O ₂	Acetic acid	20			(463)
C ₄ H ₈ O ₂	Butyric acid	20			(463)
B = NaC ₄ H ₇ O ₃ , Isobutyrate					
CH ₂ O ₂	Formic acid	20			(463)
C ₂ H ₄ O ₂	Acetic acid	20			(463)
C ₄ H ₈ O ₂	Isobutyric acid	20			(463)
B = NaC ₇ H ₅ O ₂ , Benzoate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(559)
B = Na ₂ C ₄ H ₄ O ₄ , Succinate					
CH ₂ O ₂	Formic acid	20			(463)
C ₄ H ₆ O ₄	Succinic acid	20			(463)
B = Na ₂ C ₄ H ₄ O ₅ , Malate					
CH ₂ O ₂	Formic acid	20			(463)
C ₄ H ₆ O ₅	Malic acid	20			(463)
B = Na ₂ C ₄ H ₄ O ₆ , Tartrate					
CH ₂ O ₂	Formic acid	20			(463)
C ₄ H ₆ O ₆	Tartaric acid	20			(463)
C ₁₂ H ₂₂ O ₁₁	Sucrose	15	30-40 g	180-290 g	(210)
B = Na ₃ C ₆ H ₅ O ₇ , Citrate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(559)
C ₆ H ₈ O ₇	Citric acid	20			(463)

C		t, °C	Concn. range		Lit.
Formula	Name		B	C	
B = NaC ₂ Cl ₃ O ₂ , Trichloroacetate					
C ₂ HCl ₃ O ₂	Trichloroacetic acid	20			(463)
C ₂ H ₃ ClO ₂	Chloroacetic acid	20			(463)
B = NaC ₂ H ₂ ClO ₂ , Chloroacetate					
C ₂ HCl ₃ O ₂	Trichloroacetic acid	20			(463)
C ₂ H ₃ ClO ₂	Chloroacetic acid	20			(463)
B = NaC ₂ HCl ₂ O ₂ , Dichloroacetate					
C ₂ HCl ₃ O ₂	Trichloroacetic acid	20			(463)
C ₂ H ₂ Cl ₂ O ₂	Dichloroacetic acid	20			(463)
C ₃ H ₅ O ₃	Lactic acid	20			(463)
B = NaC ₆ H ₅ O ₄ S, p-Phenolsulfonate					
C ₂ H ₅ O	Ethyl alcohol	25	satd.	entire range	(559)
B = Na ₂ Cr ₂ O ₇ ·2H ₂ O					
C ₂ H ₅ O	Ethyl alcohol	19.4	51 g		(512)
B = KF					
C ₃ H ₄ O ₄	Phthalic acid	25	0.1–0.6 m	satd.	(518)
B = KCl					
C ₂ H ₅ O	Ethyl alcohol	14.5	satd.	0–90 %	(53)
		25	0.04–0.5 N	50 Vol. %	(201)
C ₃ H ₆ O	Acetone	25	satd.	0–100 %	(281)
C ₃ H ₅ O ₃	Glycerol	25	satd.	0–100 %	(283)
C ₃ H ₄ O ₄	Phthalic acid	25, 35	0.1–2.7 m	satd.	(518)
C ₃ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = KClO ₃					
C ₃ H ₄ O ₄	Phthalic acid	25	0.03–0.6 m	satd.	(518)
C ₃ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = KBr					
C ₂ H ₅ O	Ethyl alcohol	18	0.01–0.07 N	25 % and 50 %	(313)
		25	0.04–1 N	50 Vol. %	(201)
C ₃ H ₆ O	Acetone	25	satd.	0–100 %	(281)
		25	satd.	0–90 Vol. %	(283)
C ₃ H ₅ O ₃	Glycerol	25	satd.	0–100 %	(283)
C ₃ H ₄ O ₄	Phthalic acid	25	0.1–1.8 m	satd.	(518)
B = KBrO ₃					
C ₃ H ₄ O ₄	Phthalic acid	25	0.02–0.4 m	satd.	(518)
B = KI					
C ₂ H ₅ O	Ethyl alcohol	20			(137)
		20	10–100 g	45 %	(509)
		25	0.1–2 N	50 Vol. %	(201)
C ₃ H ₆ O	Acetone	25	satd.	0–100 %	(281)
C ₃ H ₄ O ₄	Phthalic acid	25	0.1–2.0 m	satd.	(518)
C ₃ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = KIO ₃					
C ₃ H ₄ O ₄	Phthalic acid	25	0.02–0.4 m	satd.	(518)
B = K ₂ SO ₄					
C ₃ H ₄ O ₄	Phthalic acid	25	0.06–1.2 m	satd.	(518)
B = KNO ₃					
C ₂ H ₅ O	Ethyl alcohol	17.7–18	satd.	0–90 %	(53)
C ₃ H ₄ O ₄	Phthalic acid	25	0.1–2.2 m	satd.	(518)
C ₃ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = KH ₂ PO ₄					
C ₁₂ H ₂₂ O ₁₁	Sucrose	18	50–170 g	?	(210)
B = KCHO ₂ , Formate					
CH ₂ O ₂	Formic acid	20			(463)
C ₂ HCl ₃ O ₂	Trichloroacetic acid	20			(463)
C ₂ H ₄ O ₂	Acetic acid	20			(463)
C ₃ H ₅ O ₃	Lactic acid	20			(463)
C ₄ H ₇ O ₂	Butyric acid	20			(463)
C ₄ H ₉ O ₂	Isobutyric acid	20			(463)
B = KC ₂ H ₃ O ₂ , Acetate					
C ₂ H ₄ O ₂	Acetic acid	20			(463)
C ₂ H ₅ O	Ethyl alcohol	25	satd.	0–100 %	(559)
C ₄ H ₇ O ₂	Butyric acid	20			(463)
C ₄ H ₉ O ₂	Isobutyric acid	20			(463)
C ₃ H ₄ O ₄	Phthalic acid	25	0.1–0.6 m	satd.	(518)
B = KC ₂ H ₃ O ₃ , Glycolate					
CH ₂ O ₂	Formic acid	20			(463)
B = KC ₃ H ₅ O ₂ , Propionate					
CH ₂ O ₂	Formic acid	20			(463)
C ₃ H ₅ O ₂	Propionic acid	20			(463)

C		t, °C	Concn. range		Lit.
Formula	Name		B	C	
B = KC ₃ H ₅ O ₃ , Lactate					
CH ₂ O ₂	Formic acid	20			(463)
C ₂ H ₂ Cl ₂ O ₂	Dichloroacetic acid	20			(463)
C ₃ H ₅ O ₃	Lactic acid	20			(463)
B = KC ₄ H ₅ O ₆ , Acid tartrate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	entire range	(559)
B = KC ₄ H ₇ O ₂ , Butyrate					
CH ₂ O ₂	Formic acid	20			(463)
C ₂ H ₄ O ₂	Acetic acid	20			(463)
C ₄ H ₇ O ₂	Butyric acid	20			(463)
B = KC ₄ H ₇ O ₂ , Isobutyrate					
CH ₂ O ₂	Formic acid	20			(463)
C ₂ H ₄ O ₂	Acetic acid	20			(463)
C ₄ H ₉ O ₂	Isobutyric acid	20			(463)
B = K ₂ C ₄ H ₄ O ₄ , Succinate					
CH ₂ O ₂	Formic acid	20			(463)
C ₄ H ₄ O ₄	Succinic acid	20			(463)
B = K ₂ C ₄ H ₅ O ₅ , Malate					
CH ₂ O ₂	Formic acid	20			(463)
C ₄ H ₅ O ₄	Malic acid	20			(463)
B = K ₃ C ₆ H ₅ O ₇ , Citrate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	0-100 %	(559)
C ₆ H ₅ O ₇	Citric acid	20			(463)
B = KC ₂ Cl ₃ O ₂ , Trichloroacetate					
C ₂ HCl ₃ O ₂	Trichloroacetic acid	20			(463)
C ₂ H ₃ ClO ₂	Chloroacetic acid	20			(463)
B = KC ₂ H ₂ ClO ₂ , Chloroacetate					
C ₂ HCl ₃ O ₂	Trichloroacetic acid	20			(463)
C ₂ H ₃ ClO ₂	Chloroacetic acid	20			(463)
B = KC ₂ HCl ₂ O ₂ , Dichloroacetate					
C ₂ HCl ₃ O ₂	Trichloroacetic acid	20			(463)
C ₂ H ₂ Cl ₂ O ₂	Dichloroacetic acid	20			(463)
C ₃ H ₅ O ₃	Lactic acid	20			(463)
B = KCNS					
C ₃ H ₁₄ O ₆	Ethyl tartrate	26			(479)
B = KSbC ₄ H ₄ O ₇ , Antimonyl tartrate					
C ₂ H ₆ O	Ethyl alcohol	25	satd.	entire range	(559)
B = KNaC ₄ H ₄ O ₆ , Tartrate					
C ₂ H ₆ O	Ethyl alcohol	15	60-90 g	210-300 g	(210)
		25	satd.	entire range	(559)
B = RbCl					
C ₃ H ₄ O ₄	Phthalic acid	25	0.1-2.1 m	satd.	(518)
B = CsCl					
C ₃ H ₄ O ₄	Phthalic acid	25	0.07-1.5 m	satd.	(518)

Three or More Solutes in H₂O

I₂ (0–satd.) + C₂H₆O, Ethyl alcohol (40 and 60 %) + KI (satd.–0); at 25°C (471).

H₂SO₄ (5–6.4 M) + C₂H₂O₄, Oxalic acid (satd.) + La₂(SO₄)₃ (satd.); at 25°C (651).

H₂SO₄ + C₂H₂O₄, Oxalic acid + La₂(SO₄)₃ + La₂C₆O₁₂, Lanthanum oxalate; at 25°C (651).

H₂SO₄ (1.2–4.8 M) + C₂H₂O₄, Oxalic acid (satd.) + La₂C₆O₁₂, Lanthanum oxalate (satd.); at 25°C (651).

CO₂ (satd. 1 atm.) + CaSO₄ (satd.) + CaCO₃ (satd.) + NaCl (0–310 g) + Na₂SO₄ (0–260 g); at 25°C (94).

CO₂ (satd. 1 atm.) + CaCO₃ (satd.) + NaCl (10–360 g); at 25°C (94).

C₄H₆O₆, Tartaric acid + C₁₂H₂₂O₁₁, Sucrose + Na₂C₄H₄O₆, Sodium tartrate; at 15°C (209).

C₅H₁₂O, Amyl alcohol + H₃BO₃ (satd.) + NaCl (0–4 N) at 25°C (437).

NH₄HCO₃ (satd.) + NaNO₃ (0.4–1.25 N) + NaHCO₃ (satd.); at 15°C (195).

DENSITY OF SATURATED SOLUTIONS

When H₂O is written in the formula, the per cent refers to the anhydrous substance except when otherwise noted.

HCl [JAB] $p_{\text{HCl}} = 1 \text{ atm. (528)}$			(NH₄)₂SiF₆ [LJG] (581)			TiCl₄—(Continued)			HgCl₂—(Continued)		
<i>t</i>	%	<i>d</i> ₄ ^t	<i>t</i>	%	<i>d</i> ₄ ^t	<i>t</i>	%	<i>d</i> ₄ ^t	<i>t</i>	%	<i>d</i> ₄ ^t
−20	67.7	1.276	17.5	15.67	1.0946	60	1.02	0.9921	50	11.9	1.091
−10	66.7	1.261	PbCl₂ [LJG] (382)**; (262)*			70	1.29	0.9889	60	15.2	1.114
0	65.8	1.249	0	0.67	1.0065	80	1.59	0.9855	70	19.5	1.142
+10	64.9	1.239	10	0.815	1.0075	90	1.93	0.9820	80	25.2	1.180
20	64.0	1.231	20	0.98	1.0072	100	2.38	0.9785	90	33.3	1.233
25	63.6	1.228	25	1.073	1.0069	TiClO₄ [LJG] (99)			100	55.7	1.354
30	63.2	1.225	30	1.18	1.0064	0	5.8	1.060	Cu(ClO₃)₂ [WCS] (421)*		
40	62.4	1.221	40	1.41	1.0050	10	7.4	1.077	18	62.17	1.692
50	61.7	1.219	50	1.665	1.0030	20	11.1	1.104	CuSO₄·(NH₄)₂SO₄ [WCS]		
HIO₃ [JAB] (245) [LJG]			60	1.94	1.0006	25	13.5	1.122	(534)		
13.5	74.10	2.4256	70	2.235	0.9978	30	16.2	1.143	19.0	15.3	1.1316
18	74.55	2.4711	80	2.55	0.9946	40	22.1	1.194	MnCl₂ [JAB] (140) [LJG]		
NH₄NO₃ [JAB] (438)**; (114, 580)			90	2.885	0.9911	50	28.3	1.257	α-MnCl₂·4H₂O		
0	54.33	1.264	100	3.24	0.9873	60	34.4	1.332	25	43.56	1.4491
10	58.85	1.2909	Pb(ClO₃)₂ [JAB] (442)			70	40.1	1.420	30	44.66	1.5049
15	62.51	1.3003	18	60.2	1.944	80	45.2	1.521	40	46.97	1.5348
20	65.63	1.3103	PbBr₂ [LJG] (382)			Ti₂SO₄ [JAB] (39) [LJG]			50	49.53	1.5744
25	68.29	1.3200	0	0.45	1.0042	0	2.72	1.0247	MnCl₂·2H₂O		
30	70.74	1.3303	10	0.61	1.0050	10	3.70	1.0335	57.65	51.31	1.6097
32	71.72	1.3345	20	0.83	1.0057	20	4.85	1.0424	60	52.06	1.6108
32.3	71.87	1.3351	25	0.97	1.0059	25	5.48	1.0469	70	52.52	1.6134
34	72.35	1.3380	30	1.12	1.0060	30	6.16	1.0514	MnC₂O₄ [LJG] (103) [JAB]		
36	73.05	1.3411	40	1.47	1.0060	40	7.62	1.0606	MnC₂O₄·2H₂O		
38	73.85	1.3438	50	1.86	1.0053	50	9.21	1.0698	0	0.0198	1.0001
40	74.79	1.3464	60	2.29	1.0037	60	10.91	1.0791	MnC₂O₄·3H₂O		
NH₄Cl [JAB] (537, 580)**			70	2.75	1.0016	70	12.70	1.0884	0	0.0326	1.0002
15	26.3	1.0750	80	3.26	1.0001	80	14.58	1.0978	MnSiF₆ [LJG] (582)		
NH₄Br [JAB] (567)			90	3.83	0.9995	90	16.53	1.1072	17.5	37.68	1.4458
15	41.72	1.29	100	4.47	0.9991	100	18.53	1.1167	FeCl₃ [WCS] (430)		
113	61.5	1.66	PbI₂ [LJG] (382)			TiNO₃ [JAB] (39) [LJG]			25	73.1	1.793
137	65.4	1.71	0	0.044	1.00043	0	3.8	1.034	35	73.4	1.785
158	67.9	1.76	10	0.054	1.00010	10	6.0	1.055	Fe(NO₃)₂ [WCS] (461)		
NH₄ClO₄ [LJG] (99)			20	0.069	0.99893	20	8.7	1.076	15	44.35	1.485
0	11.0	1.061	25	0.079	0.9979	25	10.4	1.093	20	45.65	1.495
10	15.1	1.080	30	0.091	0.9966	30	12.4	1.114	25	46.86	1.505
20	19.1	1.098	40	0.121	0.9934	40	17.3	1.161	FeSO₄·(NH₄)₂SO₄ [WCS] (221, 533, 534)		
30	23.0	1.115	50	0.157	0.9894	50	23.6	1.227	16.5	19.13	1.1651
40	26.8	1.131	60	0.199	0.9849	60	31.6	1.330	Co(ClO₃)₂ [WCS] (421)		
50	30.4	1.146	70	0.247	0.9798	70	41.2	1.483	18	64.2	1.857
60	33.8	1.160	80	0.301	0.9745	80	52.9	1.722	Co(ClO₄)₂ [WCS] (590)		
70	37.1	1.174	90	0.361	0.9694	90	66.4	2.135	0	64.03	1.5639
80	40.3	1.188	100	0.428	0.9645	100	79.6	2.787	7.5	65.09	1.5658
90	43.5	1.202	Pb(NO₃)₂ [LJG]			104.5 (B. P.) 85.6 3.191			18	66.24	1.5670
100	46.6	1.215	17.5 (534)	34.8	1.380	Zn(ClO₃)₂ [GS] (442)			26	71.76	1.5811
NH₄IO₄ [LJG] (19)			20 (194)	35.5	1.4185	18	65	1.914	45	72.49	1.5878
16	2.63	1.0178	25 (185)	37.075	1.44450	Zn(C₂H₃O₂)₂, Acetate [JAB]			Co(NO₃)₂ [WCS] (217)		
(NH₄)₂SO₄ [JAB] (642)			25 (185)	37.035†	1.44359	(559)			18	49.73	1.572
20	42.55	1.248	† From radioactive lead.			25 25.73 1.165			Ni(ClO₃)₂ [WCS] (99, 421)		
(NH₄)₂HPO₄ [LJG] (241, 242)			Pb(C₂H₃O₂)₂, Acetate [JAB]			Zn(C₅H₉O₂)₂, Valerate [JAB]			16	60.9	1.75
14.5	56.24	1.3427	(241, 242, 559)			(559)			18	56.74	1.658
NH₄C₇H₅O₂, Benzoate [JAB]			15.56	26.44	1.2330	25	1.27	1.001	Ni(ClO₄)₂ [WCS] (590)		
(559)			25	36.54	1.340	Zn(C₆H₅SO₃)₂, <i>p</i>-Benzenesul-			0	66.48	1.5726
25	18.6	1.040	fionate [JAB] (559)			(559)			7.5	67.76	1.5755
NH₄C₇H₅O₃, Salicylate [JAB]			TiCl [JAB] (39) [LJG]			25 29.49 1.182			18	69.83	1.5760
(559)			0	0.17	1.0012	HgCl₂ [GS] (260)			26	70.80	1.5841
25	50.8	1.145	10	0.24	1.0018	0	4.2	1.039	45	74.42	1.5936
Ammonium bismuth citrate			20	0.34	1.0013	10	4.9	1.042	CrO₃ [JAB] (243, 443) [LJG]		
(47.5% Bi₂O₃) [JAB] (559)			25	0.40	1.0005	20	5.9	1.049	16.4	62.8	1.708
25	22.25	1.25	30	0.47	0.9996	30	7.3	1.059	18	62.45	1.703
			40	0.62	0.9976	40	9.3	1.073			
			50	0.80	0.9951						

(WO₃)₄·H₂O, Metatungstic acid [LJG] (569)		
<i>t</i>	%	<i>d</i> ₄ ^t
0	24.6†	1.6025
22	39.3	2.5240
43.5	44.2	3.6500

† Per cent WO₃.

H₃PO₄·12WO₃·21H₂O [LJG] (569)		
<i>t</i>	%	<i>d</i> ₄ ^t
0	12.3	1.189
22	29.4	1.691
43	30.9	1.826
92	41.1	2.581

UO₂Cl₂ [LJG] (441)		
18	76.2	2.736

3(NH₄)₂O·SiO₂·V₂O₅·<i>x</i>MoO₃·<i>y</i>H₂O [LJG] (213)		
<i>x</i>	<i>y</i>	%†
9	20	26.4
10	21	28.0
11	27	29.5
15	24	34.1

† Per cent refers to the hydrate. Density may be 18/18 or 18/4.

Al₂(SO₄)₃·Ti₂SO₄·24H₂O [JAB] (39) [LJG]

<i>t</i>	%	<i>d</i> ₄ ^t
0	3.08	1.0294
10	4.40	1.0412
20	6.03	1.0572
25	7.14	1.0678
30	8.61	1.0812
40	12.80	1.1207
50	18.64	1.1848
60	26.10	1.2807

La(IO₃)₃ [LJG] (265, 266)		
25	0.06853	0.998251

PrCl₃ [LJG] (413)		
14	51.0	1.685

Mg(ClO₃)₂ [GS] (442)		
18	56.3	1.594

Mg(IO₃)₂·4H₂O [GS] (442)		
18	6.44	1.078

MgCrO₄·7H₂O [GS] (442)		
18	42	1.422

Ca(ClO₃)₂·2H₂O [GS] (442)		
18	64	1.729

Ca(NO₂)₂ [GS] (468)		
16	42.3	1.4198

Ca₂Fe(CN)₆ [LJG] (186) [GS]		
25	36.50	1.3565
30	39.72	1.3670
40	40.27	1.3844
50	42.14	1.3972
60	43.75	1.4052
65	44.48	1.4076

Sr(ClO₃)₂ [GS] (442)		
18	63.6	1.839

Sr(NO₂)₂ [GS] (468)		
19	39.3	1.4454

Sr(NO₃)₂ [GS] (40)

<i>t</i>	%	<i>d</i> ₄ ^t
0	28.247	1.28124
5	31.567	1.31889
10	34.826	1.35709
15	38.016	1.39600
20	41.139	1.43585
25	44.229	1.47699
29.3†	46.902	1.51420
35	47.170	1.51352
40	47.404	1.51272
45	47.638	1.51192
50	47.872	1.51119
55	48.106	1.51074
60	48.343	1.51052
65	48.623	1.51046
70	48.931	1.51053
75	49.227	1.51071
80	49.519	1.51100
85	49.808	1.51139
90	50.095	1.51186

† Transition point.

Sr(C₇H₅O₃)₂ Salicylate [JAB] (559)

25	4.58	1.019
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Ba(ClO₃)₂ [GS] (99)

0	19.2	1.195
10	23.0	1.234
20	26.6	1.274
30	30.3	1.315
40	33.9	1.355
50	37.2	1.395
60	40.2	1.433
70	42.8	1.470
80	45.3	1.508
90	47.8	1.545
100	50.1	1.580
105.6	51.5	1.600

Ba(ClO₄)₂ [GS] (99)

0	67.3	1.782
20	74.3	1.912
40	78.2	2.009
60	81.2	2.070
80	83.2	2.114
100	84.9	2.155
120	86.6	2.195
140	88.3	2.230

Ba(NO₂)₂ [GS] (468)

17	40	1.4895
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Ba(NO₃)₂ [GS] (611)

0	4.9	1.043
10	6.5	1.056
20	8.4	1.073
30	10.4	1.087
40	12.4	1.104
50	14.6	1.121
60	16.9	1.137
70	19.1	1.146

LiF [LJG] (442)

18	0.27	1.002
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LiBrO₃ [LJG] (442)

18	60.4	1.830
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LiIO₃ [JAB] (442) [LJG]

18	44.6	1.566
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LiNO₂ [LJG] (468)

<i>t</i>	%	<i>d</i> ₄ ^t
19	48.9	1.3184

LiCHO₂, Formate [JAB] (244)		
18	27.85	1.140

LiC₇H₅O₂, Benzoate [JAB] (529)		
25	27.64	1.100

LiC₇H₅O₃, Salicylate [JAB] (529)		
25	52.70	1.206

Li₃C₆H₅O₇, Citrate [JAB] (559)		
25	31.78	1.2124

NaF [LJG] (442)		
18	4.3	1.043

NaCl [JAB] (39)**; (4, 5)*; (450, 470, 537, 580, 611)		
-10		1.200
0	26.34	1.2093
+10	26.35	1.2044
20	26.43	1.1999
25	26.48	1.1978
30	26.56	1.1957
40	26.71	1.1914
50	26.89	1.1872
60	27.09	1.1830
70	27.30	1.1787
80	27.53	1.1745
90	27.80	1.1703
100	28.12	1.1660
107.0 (B. P.)	28.39	1.1631

NaClO₃ [JAB] (99) [LJG]		
-15	41.9	1.380
0	44.1	1.389
+10	47.4	1.409
20	50.2	1.430
25	51.7	1.440
30	53.1	1.451
40	55.8	1.472
50	58.2	1.493
60	60.8	1.514
70	63.1	1.536
80	65.4	1.559
90	67.6	1.581
100	69.7	1.604
110	72.0	1.625
120	73.8	1.649
122 (B. P.)	74.1	1.654

NaClO₄ [LJG] (99)		
15	64.6	1.666
50	71.3	1.731
143	79.1	1.789

Na₂SO₄ [JAB] (39)**; (141)*; (612)		
0	4.47	1.0409
5	5.32	1.0577
10	8.26	1.0787
15	11.84	1.1100
20	16.04	1.1513
25	21.81	1.2081
30	29.14	1.2860
32.35†	33.15	1.3323
35	32.93	1.3283
40	32.52	1.3206

Na₂SO₄—(Continued)

<i>t</i>	%	<i>d</i> ₄ ^t
50	31.80	1.3058
60	31.15	1.2919
70	30.60	1.2789
80	30.19	1.2674
90	29.90	1.2569
100	29.69	1.2469
101.9 (B. P.)	29.67	1.2450

† Transition point.

Na₂SeO₄ [JAB] (216) [LJG]		
18	29.00	1.313

NaNO₂ [JAB] (241, 242, 468)		
15.6	42.8	1.3464
20	45.8	1.3584

NaNO₃ [JAB] (39)**; (450, 470, 611)		
0	42.23	1.3532
10	44.54	1.3683
20	46.80	1.3834
25	47.92	1.3910
30	49.02	1.3986
40	51.20	1.4139
50	53.35	1.4293
60	55.48	1.4447
70	57.59	1.4603
80	59.67	1.4759
90	61.73	1.4916
100	63.77	1.5074
110	65.80	1.5231
119.0 (B. P.)	67.62	1.5374

NaNH₄SO₄ [LJG] (538)		
15	25.2	1.174

NaH₂PO₂ [LJG] (241, 242)		
16	52.1	1.386

Na₂HPO₄ [LJG] (534)		
17	4.2	1.043

Na₃PO₄ [LJG] (537)		
14	9.5	1.103

Na₃PO₄·NaF [LJG] (72)		
25	52.4	1.030

Na₃AsO₄·NaF [LJG] (72)		
25	50.9	1.031

NaCHO₂, Formate [JAB] (244)		
18	44.73	1.316

NaC₂H₃O₂, Acetate [JAB] (559)		
25	33.61	1.205

NaC₆H₅SO₃, Benzenesulfonate [JAB] (559)		
25	16.37	1.076

NaC₇H₅O₂, Benzoate [JAB] (559)		
25	35.99	1.152

NaC₇H₅O₃, Salicylate [JAB] (559)		
25	53.56	1.248

Na₃C₆H₅O₇·5H₂O, Citrate [JAB] (559)		
25	48.10	1.2723

Na₄Fe(CN)₆ [LJG] (186)**; (265, 266) [WCS]		
25	17.1	1.1310
30	18.8	1.1445
40	22.4	1.1720

Na ₄ Fe(CN) ₆ .—(Continued)			KClO ₄ [LJG] (99)**; (439)			KC ₄ H ₅ O ₆ , Acid tartrate [JAB] (481, 559)			RbCl.—(Continued)		
<i>t</i>	%	<i>d</i> ₄ ^t	<i>t</i>	%	<i>d</i> ₄ ^t	<i>t</i>	%	<i>d</i> ₄ ^t	<i>t</i>	%	<i>d</i> ₄ ^t
50	26.1	1.200	0	0.80	1.007	18	0.55	1.0018	90	57.09	1.5912
60	29.7	1.228	10	1.35	1.009	25	0.65	0.9990	100	58.11	1.6014
70	33.4	1.256	20	2.15	1.012	K ₃ C ₆ H ₅ O ₇ , Citrate [JAB] (559)			110	59.08	1.6110
80†	37.2	1.283	30	3.20	1.016	25	60.91	1.5136	114 (B. P.)	59.46	1.6148
85	38.1	1.292	40	4.45	1.021	KSbO ₃ [JAB] (337) [LJG]			RbClO ₃ [JAB] (84) [LJG]		
90	38.2	1.294	50	6.00	1.026	18	2.73	1.0249	16.2	4.73	1.0328
95	38.0	1.291	60	7.85	1.032	KSbOC ₄ H ₄ O ₆ [JAB] (559)			RbClO ₄ [LJG] (99)		
100	37.6	1.284	70	9.95	1.040	25	7.64	1.049	0	1.09	1.0070
† Transition point at 81.7°C.			80	12.3	1.050	K ₂ SnO ₃ [LJG] (460)			10	1.22	1.0085
Na ₂ CrO ₄ [JAB] (443)**; (442) [LJG]			90	14.9	1.060	15.5	42.7	1.620	20	1.55	1.0100
18	40.10	1.430	100	17.7	1.069	K ₄ Fe(CN) ₆ [LJG] (186)**; (265, 266) [WCS]			30	2.21	1.0130
Na ₂ Cr ₂ O ₇ [JAB] (443) [LJG]			KBr [JAB] (82, 277)**			25	24.0	1.1730	40	3.16	1.0170
18	63.9	1.743	23.4	40.54	1.3711	30	26.1	1.1880	50	4.40	1.0220
Na ₂ Cr ₃ O ₁₀ .H ₂ O [LJG] (443)			25.0	40.63	1.3797	40	29.8	1.2140	60	5.94	1.0285
18	80.60	2.056	KBrO ₃ [JAB] (84) [LJG]			50	33.1	1.2360	70	7.73	1.0370
Na ₂ Cr ₄ O ₁₃ .4H ₂ O [LJG] (443)			19.2	6.25	1.0458	60	35.9	1.2550	80	9.72	1.0480
18	74.60	1.923	KI [JAB] (82)			70	38.4	1.2720	90	11.81	1.0600
Na ₄ CrO ₅ .13H ₂ O [LJG] (443)			24.3	59.74	1.7175	80	40.5	1.2865	100	13.94	1.0730
18	37.50	1.444	KIO ₃ [JAB] (84) [LJG]			90	42.3	1.2995	RbBr [JAB] (82)		
Na ₂ MoO ₄ [JAB] (216) [LJG]			18.6	7.93	1.0692	100	43.8	1.3120	23	52.67	1.6252
18	39.40	1.435	KIO ₄ [LJG] (19)			K ₂ CrO ₄ [JAB] (534) [LJG]			RbBrO ₃ [JAB] (84) [LJG]		
Na ₂ O.4WO ₃ .10H ₂ O [LJG] (532)			13	0.655	1.0051	19.5	38.4	1.3764	16	2.15	1.0159
room	77.7	3.017	K ₂ SO ₄ [JAB] (39)**; (470, 580, 611)			K ₂ Cr ₂ O ₇ [JAB] (184, 241, 242) [LJG]			RbI [JAB] (82)		
(Na ₂ O) ₃ (WO ₃) ₇ .16H ₂ O [LJG] (532)			0	6.87	1.0584	10	7.69	1.0561	24.3	63.62	1.8497
0	26.7	1.316	10	8.51	1.0706	15.8	9.19	1.0659	RbIO ₃ [JAB] (84) [LJG]		
2Na ₂ O.P ₂ O ₅ .24WO ₃ .27H ₂ O [LJG] (65)			20	10.08	1.0814	2K ₂ O.(NH ₄) ₂ O.SiO ₂ .V ₂ O ₅ .-xMoO ₃ .yH ₂ O [LJG] (213)			15.6	2.72	1.0223
20	59.13	2.001	25	10.83	1.0863	<i>x</i>	<i>y</i>	%†	RbIO ₄ [LJG] (19)		
KF.2H ₂ O [LJG] (442)			30	11.57	1.0908	9	20	20.5	16†	0.645	1.0052
18	48	1.500	40	12.97	1.0987	10	21	21.7	† Satd. at 13°C.		
KCl [JAB] (39)**; (82)*; (450, 470, 543, 580, 611)			50	14.28	1.1052	11	12	23.0	Rb ₂ SO ₄ [JAB] (39)		
0	21.90	1.1531	60	15.49	1.1104	† Per cent refers to the hydrate. Density may be 18/18 or 18/4.			0	26.65	1.2720
10	23.86	1.1647	70	16.61	1.1144	K ₂ SO ₄ .Al ₂ (SO ₄) ₃ .24H ₂ O [JAB] (39) [LJG]			10	29.80	1.3097
20	25.65	1.1742	80	17.64	1.1174	<i>t</i>	%	<i>d</i> ₄ ^t	20	32.55	1.3403
25	26.48	1.1783	90	18.59	1.1195	0	2.90	1.0289	25	33.77	1.3543
30	27.28	1.1820	100	19.44	1.1206	10	3.80	1.0396	30	34.90	1.3673
40	28.77	1.1884	101.1 (B. P.)	19.54	1.1207	20	5.44	1.0525	40	36.98	1.3908
50	30.14	1.1937	KNO ₃ [JAB] (39)**; (450, 470, 580, 611)			25	6.51	1.0604	50	38.75	1.4102
60	31.41	1.1981	0	9.46	1.0528	30	7.74	1.0699	60	40.28	1.4264
70	32.60	1.2017	10	16.88	1.1090	40	10.66	1.0948	70	41.66	1.4415
80	33.73	1.2047	20	24.29	1.1652	50	14.39	1.1289	80	42.89	1.4545
90	34.82	1.2073	25	28.00	1.1933	60	19.71	1.1805	90	44.05	1.4654
100	35.89	1.2097	30	31.70	1.2214	KNaCO ₃ [LJG] (579)			100	45.01	1.4736
108 (B. P.)	36.75	1.2118	40	39.11	1.2776	15	33.8	1.364	102.4 (B. P.)	45.23	1.4753
KClO ₃ [JAB] (99)**; (6, 84) [LJG]			50	46.39	1.3338	KNaC ₄ H ₄ O ₆ .4H ₂ O, Tartrate [LJG] (559) [JAB]			RbNO ₃ [JAB] (39)		
0	3.21	1.021	60	52.62	1.3899	25	39.71	1.308	0	16.34	1.0766
10	5.01	1.033	70	58.07	1.4413	RbCl [JAB] (39)**; (82)*			10	26.01	1.1964
20	6.96	1.045	80	62.79	1.4886	0	43.47	1.4393	20	35.43	1.3157
25	8.0	1.051	90	67.10	1.5325	10	45.70	1.4656	25	40.05	1.3751
30	9.3	1.058	100	71.00	1.5732	20	47.70	1.4893	30	44.46	1.4348
40	12.1	1.073	110	74.41	1.6119	25	48.57	1.4998	40	53.13	1.5531
50	15.6	1.092	114 (B. P.)	75.71	1.6269	30	49.41	1.5094	50	61.08	1.6679
60	19.4	1.115	KCHO ₂ , Formate [JAB] (244)			40	50.90	1.5270	60	66.80	1.7691
70	23.4	1.139	18	76.8	1.571	50	52.28	1.5421	70	71.54	1.8589
80	27.4	1.165	KHCO ₃ [JAB] (241, 242) [LJG]			60	53.60	1.5554	80	75.68	1.9397
90	31.6	1.192	16	23.8	1.1674	70	54.84	1.5684	90	78.98	2.0114
100	35.9	1.219	KC ₂ H ₃ O ₂ , Acetate [LJG] (559) [JAB]			80	56.01	1.5803	100	81.72	2.0779
104 (B. P.)	37.6	1.230	25	68.73	1.413	Rb ₂ SO ₄ .Al ₂ (SO ₄) ₃ .24H ₂ O [JAB] (39) [LJG]			110	84.14	2.1394

Rb₂SO₄.Al₂(SO₄)₃.24H₂O.—

(Continued)

<i>t</i>	%	<i>d</i> ₄ ^{<i>t</i>}
30	2.13	1.0154
40	3.17	1.0215
50	4.66	1.0314
60	6.88	1.0474
70	11.07	1.0815
CsCl [JAB] (39)**; (82)*		
0	61.84	1.8431
10	63.63	1.8786
20	65.08	1.9095
25	65.74	1.9233
30	66.36	1.9362
40	67.52	1.9598
50	68.59	1.9813
60	69.59	2.0008
70	70.53	2.0185
80	71.41	2.0351
90	72.23	2.0507
100	72.99	2.0644
110	73.70	2.0761
119.4 (B. P.)	74.36	2.0863

CsClO₃ [JAB] (84) [LJG]

<i>t</i>	%	<i>d</i> ₄ ^{<i>t</i>}
16	5.32	1.0391
CsClO₄ [LJG] (99)		
5	0.96	1.0070
25	2.01	1.0100
80	14.6	1.0840
CsBr [JAB] (82)		
21.4	53.05	1.6933
CsBrO₃ [JAB] (84) [LJG]		
16	2.55	1.0192
CsI [JAB] (82)**; (30)		
22.8	47.96	1.5451
CsIO₃ [JAB] (84) [LJG]		
15.4	2.17	1.0178
CsIO₄ [LJG] (19)		
15	2.10	1.0166
Cs₂SO₄ [JAB] (39)		
0	62.57	1.9754
10	63.36	1.9918
20	64.11	2.0063

Cs₂SO₄.—(Continued)

<i>t</i>	%	<i>d</i> ₄ ^{<i>t</i>}
25	64.48	2.0130
30	64.82	2.0193
40	65.48	2.0309
50	66.10	2.0417
60	66.67	2.0517
70	67.21	2.0611
80	67.74	2.0699
90	68.26	2.0782
100	68.76	2.0863
108.6 (B. P.)	69.18	2.0923
CsNO₃ [JAB] (39)		
0	8.57	1.0695
10	13.09	1.1038
20	18.71	1.1582
25	21.94	1.1874
30	25.34	1.2191
40	32.28	1.2898
50	39.08	1.3710
60	45.56	1.4574
70	51.80	1.5493

CsNO₃.—(Continued)

<i>t</i>	%	<i>d</i> ₄ ^{<i>t</i>}
80	57.34	1.6388
90	62.03	1.7259
100	66.31	1.8122
106.2 (B. P.)	68.78	1.8657
Cs₂SO₄.Al₂(SO₄)₃.24H₂O		
[JAB] (39) [LJG]		
0	0.21	1.0017
10	0.29	1.0022
20	0.41	1.0019
25	0.50	1.0015
30	0.60	1.0009
40	0.87	0.9998
50	1.27	0.9991
60	1.96	1.0002
70	3.14	1.0056
80	5.4	1.018
90	9.6	1.051
100	18.1	1.124
100.4 (B. P.)	18.6	1.129

TEMPERATURE OF MAXIMUM DENSITY

ONE SOLUTE

Standard Arrangement

HCl [JAB] (610); (656)**

%	<i>t</i> _m , °C
1	1.96
2	+ 0.38
3	− 1.49
4	− 4.00
5	− 7.29
6	− 11.12
7	− 15.18
8	− 19.23
9	− 23.15
10	− 26.87

HBr [JAB] (656)

%	<i>t</i> _m , °C
1	3.1
2	2.2
4	0.3

HI [JAB] (656)

%	<i>t</i> _m , °C
1	3.2
2	2.5
3	1.7
4	1.0

H₂SO₄ [JAB] (127, 147); (522, 523, 524)*; (656)**

%	<i>t</i> _m , °C
1	+ 1.5
2	− 1.0
3	− 3.5
4	− 6.0
5	− 8.6
6	− 11.3
7	− 14.0

HNO₃ [JAB] (656)

%	<i>t</i> _m , °C
1	2.0
2	0.1

NH₃ [JAB] (670)

%	<i>t</i> _m , °C
1	2.2
2	+ 0.3
4	− 3.3
6	− 7.0
8	− 10.6

NH₄NO₃ [JAB] (161); (375, 656)**

%	<i>t</i> _m , °C
0.5	3.13
1.0	2.29
1.5	1.44
2.0	+ 0.59

NH₄Cl [JAB] (108, 130, 131); (227, 656)**

%	<i>t</i> _m , °C
1	2.65
2	+ 1.26
3	− 0.21

NH₄Br [JAB] (131); (656)**

%	<i>t</i> _m , °C
2.10	1.62

NH₄I [JAB] (131); (656)**

%	<i>t</i> _m , °C
5.56	− 0.54

(NH₄)₂SO₄ [JAB] (160, 375)**

%	<i>t</i> _m , °C
1	2.33
2	+ 0.70
4	− 5.1
12	− 30.3
20	− 70.4
50	− 178

NH₄CHO₂, Formate [JAB] (656)

%	<i>t</i> _m , °C
1	2.9
2	1.7
3	+ 0.5
4	− 0.7
5	− 2.0
6	− 3.2

NH₄C₂H₃O₂, Acetate [JAB] (656)

%	<i>t</i> _m , °C
1	3.2
2	2.3
3	1.5
4	+ 0.6
5	− 0.3
6	− 1.1
7	− 2.0

NH₄C₃H₅O₂, Propionate [JAB] (656)

%	<i>t</i> _m , °C
1	3.2
2	2.5
3	1.7
4	0.9
5	+ 0.1
6	− 0.7
7	− 1.6
8	− 2.5

Pb(NO₃)₂ [LJG] (375); (397, 398)**

%	<i>t</i> _m , °C
5	− 3.5
10	− 12.5
15	− 23
20	− 35

Tl₂SO₄ [JAB] (160) [LJG]

%	<i>t</i> _m , °C
1	3.39
2	2.82
3	2.25

ZnCl₂ [GS] (161)

%	<i>t</i> _m , °C
1	2.81
2	1.50

ZnSO₄ [GS] (160, 375)

%	<i>t</i> _m , °C
1	2.56
2	+ 1.17
2.24	− 0.56
5.60	− 10.0
11.19	− 22.2
16.78	− 44.8

Zn(NO₃)₂ [GS] (161)

%	<i>t</i> _m , °C
1	2.48
2	1.01

CdCl₂ [GS] (161)

%	<i>t</i> _m , °C
1	3.06
2	2.15
3	1.22
4	0.10

CdBr₂ [GS] (397, 398)

%	<i>t</i> _m , °C
1	3.24
1	2.96
2	1.95

Cd(NO₃)₂ [GS] (161)

%	<i>t</i> _m , °C
1	2.88
2	1.74

CuCl₂ [LJG] (162)

%	<i>t</i> _m , °C
1	2.67
2	1.27

CuSO₄ [LJG] (162); (147)***

%	<i>t</i> _m , °C
0.5	3.20
1.0	2.44
1.5	1.70
2.0	1.00
2.5	+ 0.37
3.0	− 0.17
3.5	− 0.58

Cu(NO₃)₂ [LJG] (162)

%	<i>t</i> _m , °C
0.5	3.20
1.0	2.42
1.5	1.64
2.0	0.86
2.5	0.08

PtCl₄ [LJG] (398)

%	<i>t</i> _m , °C
1.27	3.4

MnCl₂ [JAB] (161) [LJG]

%	<i>t</i> _m , °C
1	2.82
2	1.92
3	1.20

MnSO₄ [JAB] (160) [LJG]

%	<i>t</i> _m , °C
1	2.59
2	1.29

Mn(NO₃)₂ [JAB] (161) [LJG]

%	<i>t</i> _m , °C
1	2.46
2	0.91

CoCl₂ [LJG] (162); (398)**

%	<i>t</i> _m , °C
0.5	3.33
1.0	2.69
2.0	1.39
3.0	0.10

CoSO₄ [LJG] (162)

%	<i>t</i> _m , °C
0.5	3.26
1.0	2.56
1.5	1.88
2.0	1.22

Co(NO₃)₂ [LJG] (162)

%	<i>t</i> _m , °C
0.5	3.21
1.0	2.44
1.5	1.67
2.0	0.89

NiCl₂ [LJG] (162); (398)**

%	<i>t</i> _m , °C
0.5	3.34
1.0	2.69
2.0	1.40

NiSO₄ [LJG] (162)

%	<i>t</i> _m , °C
0.5	3.27
1.0	2.55
1.5	1.83

Ni(NO₃)₂ [LJG] (162)

%	<i>t</i> _m , °C
0.5	3.19
1.0	2.40
1.5	1.62

Al₂(SO₄)₃ [JAB] (160) [LJG]

%	<i>t</i> _m , °C
1	2.42
2	0.87

Al(NO ₃) ₃ [JAB] (161) [LJG]		Ba(NO ₃) ₂ [GS] (161)**; (397, 398)		Na ₂ SO ₄ —(Cont'd.)		NaC ₄ H ₅ O ₄ , Acid succinate [JAB] (656)		KI.—(Cont'd.)		RbCl [JAB] (129, 131)**	
%	t _m , °C	%	t _m , °C	%	t _m , °C	%	t _m , °C	%	t _m , °C	%	t _m , °C
1	2.34	1	2.67	3	-2.97	1	2.5	3	1.11	1	3.01
2	0.63	2	1.49	4	-5.31	2	+1.1	4	+0.10	2	2.03
BeSO ₄ [GS] (161)				5	-7.67	3	-0.4	K ₂ SO ₄ [JAB] (127, 160)**; (397)*; (147, 219, 522, 523, 524, 585)		3	+1.03
1	2.65	LiCl [JAB] (129, 131)**; (656)		6	-10.04	4	-1.8	1	2.26	4	-0.02
Be(NO ₃) ₂ [GS] (161)		1	2.58	7	-12.43	NaHSO ₄ [JAB] (656)		2	+0.53	5	-1.11
1	2.69	2	+1.10	1	+1	1	2.5	3	-1.23	6	-2.24
2	1.35	3	-0.46	2	-1	2	+1.0	4	-3.02	RbBr [JAB] (131)	
MgCl ₂ [GS] (161)		4	-2.07	4	-7	3	-0.6	5	-4.84	RbI [JAB] (131)	
1	2.54	5	-3.71	6	-13	KOH [JAB] (147)		6	-6.68	Rb ₂ SO ₄ [JAB] (160)	
2	1.16	LiBr [JAB] (130, 131)**; (656)		8	-19	1	+1.4	KNO ₃ [JAB] (161)**; (396, 398)*; (397, 656)		1	2.87
MgSO ₄ [GS] (160, 375)		1	3.17	10	-25	2	-1.2	1	2.23	2	1.77
1	2.35	2	2.34	12	-31	4	-6.8	2	0.52	3	0.65
2	0.75	3	1.48	NaNO ₃ [JAB] (161)**; (375, 397, 398, 656)		6	-13.0	K ₂ CO ₃ [JAB] (147, 585) [LJG]		RbNO ₃ [JAB] (161)	
1.85	+0.13	4	0.58	1	+1.69	KCl [JAB] (127, 129, 131)**; (227, 656)		1	+1.8	1	2.77
4.84	-8.2	LiI [JAB] (130, 131)**; (656)		2	-0.58	1	2.39	2	-0.4	2	1.55
9.61	-20.7	1	3.38	Na ₂ CO ₃ [JAB] (147)		2	+0.82	3	-2.6	3	0.28
14.37	-46.3	2	2.75	1	+0.9	3	-0.75	4	-4.9	CsCl [JAB] (161)	
Mg(NO ₃) ₂ [GS] (161)		3	2.09	2	-2.2	KBr [JAB] (131)**; (375, 656)		5	-7.3	1	3.26
1	2.23	4	1.40	4	-8.3	1	2.91	6	-9.9	2	2.54
2	0.40	5	+0.68	6	-14.5	2	1.81	7	-12.7	3	1.79
CaCl ₂ [GS] (132)**; (146)		6	-0.05	Na ₂ C ₂ O ₄ , Oxalate [JAB] (656)		3	+0.66	K ₃ Fe(CN) ₆ [LJG] (375)		4	1.01
1	0.58	Li ₂ SO ₄ [JAB] (160)		1	+1.6	4	-0.54	5	-8	Cs ₂ SO ₄ [JAB] (160)	
CaBr ₂ [GS] (132)		1	2.20	2	-0.8	KI [JAB] (127, 131)**; (656)		10	-21	1	3.10
1	1.83	2	0.44	3	-3.2	1	3.04	15	-36	2	2.23
CaI ₂ [GS] (132)		LiNO ₃ [JAB] (161)**; (656)		4	-5.6	2	2.09	20	-52	3	3.06
1	2.03	1	2.09	NaCHO ₂ , Formate [JAB] (656)		Two or more solutes		Sea Water [JAB] (380, 408, 445, 522, 523, 524, 636)			
CaSO ₄ [GS] (160)		2	+0.23	1	+2.0	Wt. % Cl.....	0.5	1.0	1.5	2.0	
0.2	3.56	4	-3.5	2	0.0	Wt. % total solids.....	0.91	1.81	2.71	3.61	
Ca(NO ₃) ₂ [GS] (161)		6	-7.2	3	-2.0	t _m , °C.....	2.4	0.5	-1.3	-3.2	
1	2.16	NaCl [JAB] (127, 129, 131, 396, 397)**; (142, 146, 147, 219, 227, 522, 523, 524, 656)		4	-4.0	For other solutions, v. (108, 227, 398).					
2	0.32	1	+1.77	5	-6.1	LITERATURE					
SrCl ₂ [GS] (161)		2	-0.57	6	-8.1	(For a key to the periodicals see end of volume)					
1	2.62	3	-3.04	1	2.3	(1) Abegg, 7, 11: 248; 93. (2) Agerer, 75, 114 IIa: 803; 05. (3) Almén, 388, 55: 735; 98. (4) Andreae, 52, 30: 305; 84. (5) Andreae, 52, 30: 312; 84. (6) Andreae, 7, 82: 109; 13. (7) Anthon, 52, 7: 70; 36. (8) Anthon, 52, 9: 1; 37. (9) Anthon, 185, 1860: 744.					
2	1.19	4	-5.61	2	+0.5	(10) Applebey, 4, 97: 2000; 10. (11) Archibald, 292, 9: 335; 97. (12) Armstrong and Wheeler, 135, 103: 133; 11. (13) Asch, 93, 28: 273; 01. (14) Atwell and Fuwa, 45, 15: 617; 23. (15) Bach, 7, 9: 241; 92. (16) Bahr, 93, 71: 79; 11. (17) Balareff, 93, 71: 70; 11. (18) Barbier and Roux, 27, 3: 424; 90. (19) Barker, 4, 93: 15; 08.					
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2	+1.34	NaBr [JAB] (131)**; (656)		7	-6.9	(101) Berkeley, Hartley and Stephenson, 62, 209: 319; 09. (102) Berkeley, Hartley and Stephenson, 62, 209: 319; 09. (103) Berkeley, Hartley and Stephenson, 62, 209: 319; 09. (104) Berkeley, Hartley and Stephenson, 62, 209: 319; 09. (105) Berkeley, Hartley and Stephenson, 62, 209: 319; 09. (106) Berkeley, Hartley and Stephenson, 62, 209: 319; 09. (107) Berkeley, Hartley and Stephenson, 62,					
4	-6.1	1	2.54	1	2.6	NaC ₂ H ₃ O ₂ , Acetate [JAB] (656)					
8	-15.3	2	+1.12	2	+1.1	1					
15	-49.6	3	-0.30	3	-0.3	2					
25	-106	4	-0.47	4	-1.8	3					

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(634) Watts, 135, 12: 160; 65. (635) Watts, 4, 19: 499; 66. (636) Weber, *Ber. Unters. deut. Meer*, 3: 1; 78. 427, 2: 696; 78. (637) Wegscheider, 57, 27: 13; 06. (638) Wegscheider and Amann, 57, 36: 633; 15. (639) Wegscheider and Walter, 57, 26: 685; 05.
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DENSITIES (SPECIFIC GRAVITIES) AND THERMAL EXPANSION OF AQUEOUS SOLUTIONS OF ORGANIC COMPOUNDS*

J. L. CRENSHAW

EXPLANATORY

The reader should consult only Table 1, Sec. A, and Table 2. These together constitute a complete index to the subject.

REMARQUE

Le lecteur ne devra consulter que la Table 1, Sec. A, et la Table 2, dont l'ensemble constitue un index complet sur ce sujet.

BEMERKUNG

Man benütze nur die Tabelle 1, Abtlg. A und Tabelle 2. Diese beiden zusammen bilden das vollständige Verzeichnis über diesen Abschnitt.

AVVERTENZA

Si consultino solo la Tabella 1, Sezione A, e la Tabella 2. Le due tabelle costituiscono l'indice completo di questo capitolo.

TABLE 1

d (resp. d_w , d_s) = density of the solution [resp. water (v. p. 24), resp. the pure liquid solute] in g/ml. p_s (resp. p_w) = weight % of solute (resp. water) in the solution. "Range" = range of applicability of the equation. \pm indicates the maximum error which will probably occur in the range given. Under "Literature" are given the sources (used) of the data upon which the equation is based and (conf.) of confirmatory determinations.

TABLE 1

d (resp. d_w , d_s) = densité de la solution [resp. eau (v. p. 24) ou le liquide pur dissout] en g/ml. p_s (resp. p_w) = % poids du corps dissout (resp. de l'eau) dans la solution. "Range" = intervalle d'application de l'équation. \pm indique l'erreur maximum qui peut résulter dans l'intervalle donné. Sous "Literature" on a indiqué les sources (used) des valeurs au moyen desquelles on a établi l'équation et celles (conf.) des déterminations de confirmation.

TAFEL 1

d (beziehungsweise d_w , d_s) = Dichte der Lösung [bzw. Wasser (p. 24); reines Lösungsmittel] in g/ml. p_s (bzw. p_w) = Gewichtsprocente des gelösten Stoffes (bzw. Wasser) in der Lösung. "Range" = Gültigkeitsbereich der Gleichung. \pm zeigt den maximalen Fehler an, der sich im Gültigkeitsbereich der Gleichung möglicherweise ergibt. Unter "Literature" stehen die Literaturquellen aus denen sich die Daten, die der Gleichung zugrunde liegen, ergeben haben, (used). Unter (conf.) sind diese Gleichung noch bestätigende Angaben verzeichnet.

TABELLA 1

d (oppure d_w , d_s) = densità della soluzione [rispettiv. dell'acqua (p. 24) o del solvente puro] in g/ml. p_s (oppure p_w) = percentuale in peso della sostanza disciolta (o dell'acqua) nella soluzione. "Range" = intervallo di applicabilità dell'equazione. Il segno \pm esprime l'errore massimo che può aversi nell'intervallo di applicabilità dell'equazione. Sotto la dicitura "Literature" si trovano i richiami bibliografici dei lavori dai quali sono stati estratti i dati che figurano nelle equazioni (used) e quelli dei lavori che contengono determinazioni di conferma (conf.).

Section A. $d = d_w + Ap_s + Bp_s^2 + Cp_s^3$

Formula	Name	t , °C	Range, p_s	A	B	C	\pm	Lit.	
								Used	Conf.
CH ₂ O	Formaldehyde.....	15	0- 40	+0.02518	-0.04658	+0.06542	0.001	(14)	(75)
CH ₂ O ₂	Formic acid.....	v. p. 122							
CH ₃ NO	Formamide.....	25	22- 96	+ .021217	+ .03199	- .02529	.001	(77)	
CH ₄ N ₂ O	Urea.....	14.8	0- 12	+ .023213	- .04802	+ .031216	.0001	(45)	(108)
		18	0- 51	+ .02718	+ .031552	+ .02573	.0004	(128)	(142)
		20	0- 35	+ .02702	+ .03712	- .02285	.0002	(142)	(103, 128)
		25	0- 10	+ .02728	- .01817	+ .031379	.0002	(103)	(8)
CH ₄ N ₂ S	Thiourea.....	15	0- 7	+ .02995	- .0374		.0003	(122)	(126)
CH ₄ O	Methyl alcohol.....	v. p. 115							
C ₂ HCl ₃ O ₂	Trichloroacetic acid.....	12.5	0- 61	+ .02499	+ .04153		.0003	(42)	(82)
		20	10- 30	+ .025032	+ .041387		.001	(63, 64)	(82)
		25	0- 94	+ .025051	+ .06119	+ .061038	.002	(71)	(42, 63, 64)
C ₂ H ₂ Cl ₂ O ₂	Dichloroacetic acid.....	20	0- 30	+ .024427	+ .0537	+ .07534	.0002	(71)	(51, 63, 64)
		25	0- 97	+ .024427	+ .0537	+ .07534	.003	(71)	
C ₂ H ₂ O ₄	Oxalic acid.....	0	0- 4	+ .025898	- .03185	+ .041	.0002	(103)	
		15	0- 4	+ .02494	- .058		.0003	(37)	(103, 136)

* *Id est*: The solute is an organic compound whose key-formula begins with 16. Exceptions: for sugars, v. Vol. II, p. 334; for salts, v. p. 51.

* Le corps dissout est un composé organique dont la formule clé commence par 16. Exceptions: pour les sucres, v. Vol. II, p. 334; pour les sels, v. p. 51.

* Der gelöste Stoff ist eine organische Verbindung, deren Schlüssel-formel mit 16 beginnt. Ausnahmen: Zuckerarten, Bd. II, p. 334; Salze, p. 51.

* La sostanza disciolta è un composto organico, la cui formula chiave comincia con 16. Eccettuati: gli zuccheri, Vol. II, p. 334 ed i sali, p. 51.

Section A. $d = d_w + Ap_s + Bp_s^2 + Cp_s^3$.—(Continued)

Formula	Name	$t, ^\circ\text{C}$	Range, p_s	A	B	C	\pm	Lit.	
								Used	Conf.
$\text{C}_2\text{H}_2\text{O}_4$	Oxalic acid, <i>Continued</i>	17.5	0- 9	+0.02494	-0.028		0.0005	(37)	(94, 136)
		20	0- 4	+ .025264	- .031996	+0.04254	.0001	(103)	(82, 94)
		25	0- 4	+ .025108	- .031607	+ .04208	.00005	(103)	(100)
$\text{C}_2\text{H}_3\text{ClO}_2$	Chloroacetic acid.....	20	0- 32	+ .023648	+ .03302		.0005	(63, 64)	(59, 82, 88)
		25	0- 86	+ .023602	+ .03552	+ .0722	.002	(71)	(63, 82)
		0	0- 70	+ .024489	+ .02802	- .071291	.0004	(125)	(7)
$\text{C}_2\text{H}_3\text{Cl}_3\text{O}_2$	Chloral hydrate†.....	15	0- 78	+ .024455	+ .02198	+ .074366	.0005	(125)	(7)
		30	0- 90	+ .024401	+ .041887	+ .076549	.0005	(125)	(7, 32)
		15	0- 16	- .021175	- .02024		.001	(122)	
$\text{C}_2\text{H}_3\text{N}$	Acetonitrile.....	18	0- 30	+ .03255	- .0316		.001	(49, 127, 129)	
$\text{C}_2\text{H}_4\text{O}$	Acetaldehyde.....	v. p. 123							
$\text{C}_2\text{H}_4\text{O}_2$	Acetic acid.....	15	0- 6	+ .03639	+ .04171		.0002	(121)	(126)
$\text{C}_2\text{H}_5\text{NO}$	Acetamide.....	v. p. 116							
$\text{C}_2\text{H}_6\text{O}$	Ethyl alcohol.....	0	0-100	+ .021483	+ .02992	- .075248	.001	(111)	†
$\text{C}_2\text{H}_6\text{O}_2$	Ethylene glycol.....	15	0- 6	+ .02133	- .03108		.0005	(121)	
$\text{C}_2\text{H}_5\text{ClN}$	Ethylamine hydrochloride.....	21	0- 65	+ .021193	- .03307	- .0747	.0005	(107)	
$\text{C}_3\text{H}_4\text{O}_4$	Malonic acid.....	20	0- 40	+ .02389	+ .041066		.001	(118)	(121)
		0	0-100	- .03856	- .03449	- .07588	.001	(113)	†
		4	0-100	- .037648	- .041193	+ .03272	.001	(117)	†
$\text{C}_3\text{H}_6\text{O}$	Acetone.....	15	0-100	- .021009	- .039682	- .03624	.0005	(117)	†(121)
		20	0-100	- .021233	- .03529	- .075327	.001	(96)	(59.1, 68)†
		25	0-100	- .021171	- .03904	- .0356	.0005	(117)	(113)†
$\text{C}_3\text{H}_6\text{O}$	Allyl alcohol†.....	0	0- 89	- .03729	- .041232	+ .072984	.001	(131)	(74)
$\text{C}_3\text{H}_6\text{O}_2$	Methyl acetate.....	20	0- 20	+ .0340	- .0374		.0001	(98)	(121)
$\text{C}_3\text{H}_6\text{O}_2$	Propionic acid.....	18	0- 10	+ .0395	- .04172		.0005	(133)	(52)
		25	0- 40	+ .039245	- .0399	+ .07361	.0005	(19, 67, 100)	(97, 133)
		25	0- 9	+ .02231	+ .03186		.0003	(97, 100)	(35)
$\text{C}_3\text{H}_6\text{O}_3$	Lactic acid.....	20	0- 56	+ .021278	- .03245	- .073437	.0002	(99)	(126)
$\text{C}_3\text{H}_7\text{NO}_2$	Urethane.....	v. p. 119							
$\text{C}_3\text{H}_8\text{O}$	Propyl alcohol.....	v. p. 121							
$\text{C}_3\text{H}_8\text{O}_3$	Glycerol.....	25	0- 40	+ .0334	+ .0375		.0005	(132)	(121)
$\text{C}_4\text{H}_4\text{O}_4$	Maleic acid.....	25	0-5.5	+ .03304			.0002	(102)	(63, 100, 121)
$\text{C}_4\text{H}_6\text{O}_4$	Succinic acid.....	20	0- 40	+ .03933	+ .03957		.001	(118)	(79, 134, 137)
$\text{C}_4\text{H}_6\text{O}_5$	Malic acid.....	25	0- 40	+ .03736	+ .04175		.001	(132)	(25)
		15	0- 15	+ .04482	+ .04185		.0005	(72)	(121)
		17.5	0- 50	+ .04455	+ .04185		.0001	(59)	(134)
$\text{C}_4\text{H}_6\text{O}_6$	Tartaric acid (<i>d</i> -, <i>l</i> -, or <i>dl</i> -).....	20	0- 50	+ .04432	+ .041837		.0005	(134)	(38, 82, 90, 92)
		30	0- 50	+ .04335	+ .04185			(134)	
		40	0- 50	+ .04265	+ .04185			(134)	
$\text{C}_4\text{H}_8\text{O}_2$	<i>n</i> -Butyric acid*.....	50	0- 50	+ .04205	+ .04185			(134)	
		60	0- 50	+ .04155	+ .04185			(134)	
		18	0- 10	+ .0414	+ .04131		.0003	(52, 120)	(121)
$\text{C}_4\text{H}_8\text{O}_2$	Isobutyric acid*.....	25	0- 62	+ .035135	- .04166	+ .0611	.0005	(19, 67)	(97)
		15	0- 9	+ .0352			.0001	(121)	(52)
		18	0- 9	+ .0345			.0001	(52)	(121)
$\text{C}_4\text{H}_{10}\text{O}$	Ethyl ether*.....	20	0- 5	- .0221	+ .0448		.0001	(98)	(50)
		25	0-4.5	- .0221	+ .0435		.0001	(50)	(98, 113)
		20	0-7.9	- .021651	+ .04285		.0002	(96)	(120)
$\text{C}_4\text{H}_{10}\text{O}$	<i>n</i> -Butyl alcohol*†.....	15	0- 8	- .02146	+ .06		.0003	(17, 121)	
$\text{C}_4\text{H}_{10}\text{O}$	Isobutyl alcohol*.....	20	0- 8	- .02169	+ .0438		.0002	(120)	(130)
$\text{C}_4\text{H}_{10}\text{O}$	Trimethyl carbinol*.....	20	0-100	- .02117	- .041908	+ .0957	.001	(18)	(139)
		25	0-100	- .021286	- .04176	+ .0987	.001	(18)	(139)
		21	0- 36	+ .0334	+ .076		.0004	(107)	(64)
$\text{C}_4\text{H}_{12}\text{ClN}$	Diethylamine hydrochloride.....	20	0- 8	+ .021827	+ .03366		.0002	(70)	(112)
$\text{C}_5\text{H}_4\text{O}_2$	Furfural†.....	25	0- 8	+ .021664	+ .0421		.0004	(70)	(112)
$\text{C}_5\text{H}_5\text{N}$	Pyridine*†.....	25	0- 60	+ .03229	- .0204	- .0328	.0003	(54)	(24, 30, 43, 113)
$\text{C}_5\text{H}_{10}\text{O}_2$	<i>n</i> -Valeric acid.....	25	0- 3	+ .0334	- .0427		.0002	(19)	(97)
$\text{C}_5\text{H}_{10}\text{O}_2$	Isovaleric acid.....	25	0- 5	+ .03253	- .04282		.0002	(120)	(113)
$\text{C}_5\text{H}_{12}\text{O}$	Isoamyl alcohol.....	20	0-2.5	+ .02155	- .043		.0003	(122)	
$\text{C}_6\text{H}_5\text{NO}_2$	<i>p</i> -Nitrophenol.....	15	0-1.5	+ .023216	- .0455		.0001	(122)	
$\text{C}_6\text{H}_6\text{O}$	Phenol.....	15	0- 5	+ .02111	- .04283		.0002	(36)	
		80	0- 65	+ .03462	- .086		.001§	(128)	(126)
		18	0- 52	+ .02201	+ .0519	- .0319	.0005	(54)	
$\text{C}_6\text{H}_6\text{O}_2$	Resorcinol.....	25	0- 70	- .04386	+ .031405	- .04167	.0006	(54)	
$\text{C}_6\text{H}_7\text{N}$	α -Picoline*.....	25	0- 60	- .04683	- .0313		.0004	(128)	(89)
$\text{C}_6\text{H}_7\text{N}$	β -Picoline*.....	18	0- 50	+ .03824	+ .04141	+ .0717	.0005	(107)	
$\text{C}_6\text{H}_8\text{O}_7 + \text{H}_2\text{O}$	Citric acid (hydrate).....	21	0- 54	+ .046	+ .0558	- .0369	.001	(6)	
$\text{C}_6\text{H}_{16}\text{ClN}$	Triethylamine hydrochloride.....	0	26- 51	+ .03336	+ .03996	+ .071544	.0002	(6)	
$\text{C}_7\text{H}_{14}\text{O}_6$	α -Methyl glucoside.....	30	26- 51	+ .03151	+ .03975	+ .03978	.0002	(26)	(100)
$\text{C}_8\text{H}_8\text{O}_3$	Phenylglycolic acid.....	25	0- 11	+ .02207	+ .0423		.001	(48)	(84, 143, 144)
$\text{C}_8\text{H}_{14}\text{O}_6$	Ethyl tartrate†.....	15	0- 95	+ .02367	+ .03358	- .076005	.0005	(107)	
$\text{C}_8\text{H}_{20}\text{ClN}$	Tetraethylammonium chloride.....	21	0- 63	+ .031884	+ .06	+ .07122	.0003	(53)	(91, 135)
$\text{C}_{10}\text{H}_{14}\text{N}_2$	Nicotine*.....	20	0- 60	+ .03642	+ .0454	- .07687	.0005	(81)	
$\text{C}_{11}\text{H}_{16}\text{O}_{10}$	Benzenepentacarboxylic acid.....	25	0-0.6	+ .025616	- .02117		.00005		

Section B. $d = d_s + Ap_w + Bp_w^2 + Cp_w^3$

Formula	Name	d_s	$t, ^\circ\text{C}$	Range, p_w	A	B	C	\pm	Lit.	
									Used	Conf.
$\text{C}_4\text{H}_8\text{O}_2$	<i>n</i> -Butyric acid.....	0.9534	25	0-38	+0.021854	-0.042314		0.001	(19, 67)	†
$\text{C}_4\text{H}_8\text{O}_2$	Isobutyric acid.....	0.9425	26	0-80	+ .021808	- .042358	+0.061253	.001	(36, 123)	(20)†
$\text{C}_4\text{H}_{10}\text{O}$	Ethyl ether.....	0.7077	25	0-1.1	+ .0234	+ .0336		.0001	(50)	(113)†
$\text{C}_4\text{H}_{10}\text{O}$	<i>n</i> -Butyl alcohol.....	0.8097	20	0-20	+ .022103	- .04113		.0005	(96)	(1)†
$\text{C}_4\text{H}_{10}\text{O}$	Isobutyl alcohol.....	0.8170	0	0-14	+ .022437	- .04285		.0002	(139)	†
		0.8055	15	0-16	+ .02224	- .04129		.0002	(17)	†
$\text{C}_4\text{H}_{10}\text{O}$	Trimethyl carbinol.....	0.7856	20	0-20	+ .022287	+ .0275		.0002	(18, 139)	
$\text{C}_5\text{H}_5\text{N}$	Pyridine.....	0.9776	25	0-40	+ .021157	- .05536	- .062	.001	(43)	(54, 30)
$\text{C}_6\text{H}_7\text{N}$	α -Picoline.....	0.9404	25	0-30	+ .022715	- .0393		.0005	(54)	
$\text{C}_6\text{H}_7\text{N}$	β -Picoline.....	0.9515	25	0-40	+ .021925	- .0352	+ .0625	.0005	(54)	
$\text{C}_{10}\text{H}_{14}\text{N}_2$	Nicotine.....	1.0093	20	0-40	+ .02199	- .0331	+ .07315	.0002	(91)	(53)†

Section C. $d_t = d_0 + A_t + B_t^2$

Formula	Name	p_s	d_0||	Range, $^\circ\text{C}$	A	B	\pm	Lit.	
								Used	Conf.
$\text{C}_2\text{H}_3\text{Cl}_3\text{O}_2$	Chloral hydrate.....	2.00	(1.0094)	7-80	-0.042597	-0.04313	0.0004	(7)	(104, 125)
		10.00	(1.0476)	7-80	- .047955	- .04253	.0004	(7)	(104, 125)
$\text{C}_3\text{H}_6\text{O}$	Allyl alcohol.....	76.60	0.9122	0-45	- .038	- .027	.0003	(74)	(131)
$\text{C}_4\text{H}_{10}\text{O}$	<i>n</i> -Butyl alcohol.....	80.95	0.8614	0-43	- .037292	- .0675	.001	(1)	(96)
$\text{C}_5\text{H}_4\text{O}_2$	Furfural.....	4.62	(1.0125)	22-74	- .03232	- .0254	.0005	(112)	(70)
		5.69	(1.0140)	22-74	- .03221	- .0268	.0005	(112)	(70)
		6.56	(1.0155)	22-74	- .03211	- .0290	.0005	(112)	(70)
		9.34	(1.0055)	11-73	- .03171	- .03615	.0005	(113)	(54)
$\text{C}_5\text{H}_5\text{N}$	Pyridine.....	21.20	(1.0115)	14-73	- .03378	- .0248	.0005	(113)	(54)
		29.50	(1.0145)	12-72	- .03463	- .0235	.0005	(113)	(54)
		40.40	(1.0182)	9-74	- .03605	- .0167	.001	(113)	(54)
		5.00	(1.0150)	15-80	- .032103	- .02544	.0005	(144)	(48)
$\text{C}_8\text{H}_{14}\text{O}_6$	Ethyl tartrate.....	10.00	(1.0270)	15-80	- .032116	- .02929	.0005	(144)	(48)
		25.00	(1.0665)	15-80	- .03401	- .023	.0005	(144)	(48)

* For data on more concentrated solutions, v. Section B.

† For data regarding thermal expansion, v. Section C.

‡ The value for 100 % agrees with that given by Brunel and Van Bibber (p. 27) within the limit of error indicated.

§ Above 40 % the limit of error is possibly 0.002.

|| The values for d_0 , which are enclosed in parentheses, have been obtained by extrapolation and are to be used for the purpose of calculation only.TABLE 2.—MISCELLANEOUS AND FRAGMENTARY DATA (THE \mathcal{C} -ARRANGEMENT)

Formula	Name	Range, $^\circ\text{C}$	Range, p_s	Lit.	Formula	Name	Range, $^\circ\text{C}$	Range, p_s	Lit.
CHCl_3	Chloroform.....	0-55	Satd. sol.	(10)	$\text{C}_2\text{H}_3\text{Cl}_3\text{O}_2$	Chloral hydrate.....	0-47	Satd. sol.	(116)
CH_2O	Formaldehyde.....	18	0-37	(2)			4-45	75.4	(86)
CH_3NO	Formamide.....	25	1.7-100	(23)			11	9-47	(3)
		0-84	Satd. sol.	(116)			20	4-33	(56)
$\text{CH}_4\text{N}_2\text{O}$	Urea.....	5	3-10	(103)	$\text{C}_2\text{H}_3\text{N}$	Acetonitrile.....	20, 44	0-80	(104)
		10	3-10	(103)			29	50 % vol.	(105)
		15	3-10	(103)	$\text{C}_2\text{H}_4\text{O}$	Acetaldehyde.....	17, 18	30-100	(49, 127)
		15, 30	1.5-5.9	(95)			20	4, 17	(64)
		15	0-20	(122)	$\text{C}_2\text{H}_4\text{O}_3$	Glycolic acid.....	20	7.6	(82)
		20	3	(126)			25	4	(100)
CH_5N	Methylamine.....	25	5.9	(31)	$\text{C}_2\text{H}_5\text{I}$	Ethyl iodide.....	15-72	0.3	(113)
		25	1-46	(23)			0-68	Satd. sol.	(116)
		30-80	0-11	(61)	$\text{C}_2\text{H}_5\text{NO}$	Acetamide.....	25	0-69	(23)
		25	0-3	(55)			25	5.9	(31)
CH_6ClN	Methylamine hydrochloride.....	25	0-6.7	(55)			25	34	(56)
$\text{C}_2\text{HBr}_3\text{O}$	Bromal.....	40-100	45-100	(29)	$\text{C}_2\text{H}_5\text{NO}_2$	Glycocoll.....	20	3.7	(126)
$\text{C}_2\text{HBr}_3\text{O}_2$	Tribromoacetic acid.....	16	20, 30	(51)	$\text{C}_2\text{H}_6\text{NO}$	Methylurea.....	25	7.4	(31)
$\text{C}_2\text{HCl}_3\text{O}$	Chloral.....	50-90	2-100	(60)	$\text{C}_2\text{H}_6\text{O}_2\text{S}$	Dimethyl sulfone.....	26	2.5	(56)
$\text{C}_2\text{HCl}_3\text{O}_2$	Trichloroacetic acid.....	0	21-86	(11)	$\text{C}_2\text{H}_7\text{N}$	Dimethylamine.....	25	0-3	(55)
		0, 15, 30	11-90	(125)			24	11	(56)
		16	10-20	(51)	$\text{C}_2\text{H}_5\text{ClN}$	Ethylamine hydrochloride....	25	1-8	(55)
		20	10-58	(141)			25	1-8	(55)
		16	7.5	(51)	$\text{C}_2\text{H}_5\text{ClN}$	Dimethylamine hydrochloride..	25	1-8	(55)
		20	13	(82)	$\text{C}_3\text{H}_4\text{O}_4$	Malonic acid.....	15-25	59	(87)
$\text{C}_2\text{H}_2\text{Cl}_2\text{O}_2$	Dichloroacetic acid.....	25	0-12	(55)	$\text{C}_3\text{H}_6\text{O}$	Allyl alcohol.....	15	0-6	(121)
		15	2.2	(121)			0-60	0-100	(113)
		16-30	9	(110)	$\text{C}_3\text{H}_6\text{O}$	Acetone.....	15	15-100	(39)
		17-20	3.5-7	(58)			15	1-10	(93)
		17.5	3.5-7	(34)			20, 25	10-100	(59.1)
		18	4.5	(66)			25	10-100	(46)
$\text{C}_2\text{H}_2\text{O}_4$	Oxalic acid.....	20	2.4	(80)	$\text{C}_3\text{H}_6\text{O}_2$	Propionic acid.....	0	17-100	(11)
		20	7.8	(63)			4, 15, 25	80	(85)
		21	7.4	(56)			15	0-7	(121)
		30	4.3	(78)			16	10, 33	(51)
		30	12.6	(73)			17	50-100	(21)
		16	20, 30	(51)			20	8-97	(141)
$\text{C}_2\text{H}_3\text{BrO}_2$	Bromoacetic acid.....	16	20, 30	(51)					

TABLE 2.—MISCELLANEOUS AND FRAGMENTARY DATA (THE \mathcal{C} -ARRANGEMENT).—(Continued)

Formula	Name	Range, °C	Range, p_s	Lit.	Formula	Name	Range, °C	Range, p_s	Lit.
$C_3H_6O_2$	Propionic acid, <i>Continued</i>	20	10, 30, 50	(120)	$C_4H_{10}O$	<i>sec.</i> -Butyl alcohol.....	20	0-17.8,	(12)
		20	67-89	(62)				64-100	
		20	13, 15	(64)	$C_4H_{10}O$	Trimethyl carbinol.....	0-70	63-100	(83)
		20	7.4	(82)	$C_4H_{10}O$	Erythritol.....	19.5	14.3	(56)
		25	40-100	(67)	$C_4H_{11}N$	Butylamine.....	20	8, 15, 29	(64)
$C_3H_6O_2$	Methyl acetate.....	25	50-100	(19)	$C_4H_{11}N$	Diethylamine.....	20	11, 15.8	(64)
		17-63	5-10,	(113)	$C_4H_{12}ClN$	Diethylamine hydrochloride....	25	1-7.4	(55)
$C_3H_6O_2$	Ethyl formate.....	10-40	85-95	(113)	$C_4H_{12}ClN$	Butylamine hydrochloride.....	20	5, 7, 9	(64)
$C_3H_6O_3$	Lactic acid.....	20	6, 95	(113)	$C_4H_{12}ClN$	Tetramethylammonium chloride	25	1-9	(55)
$C_3H_6O_3$	<i>dl</i> -Lactic acid.....	20	9	(82)	$C_4H_{13}NO$	Tetramethylammonium hydrox- ide.....	25	0-4.5	(55)
$C_3H_6O_4$	Glyceric acid.....	20	15, 34	(64)	$C_5H_4O_2$	Furfural.....	22-97	96	(112)
C_3H_7N	Allylamine.....	15	8.5, 11	(64)	$C_5H_4O_3$	Pyromucic acid.....	25.8	2.2	(56)
C_3H_7NO	Propionamide.....	25	0-5.7	(121)			0	9-100	(4)
		25	0-70	(23)			0-70	67	(74)
$C_3H_8N_2O$	Dimethylurea.....	25	7.3	(31)			0-100	33-100	(30)
$C_3H_8O_2$	Methylal.....	12-33	8.8	(31)	C_5H_8N	Pyridine.....	9-74	66, 78, 90	(113)
C_3H_9N	Propylamine.....	15	10, 20, 30	(113)			15	1-36	(122)
C_3H_9N	Trimethylamine.....	15	0-6	(121)			15-87	12-87	(47)
		25	15-100	(123)			25	30-60	(27)
$C_3H_{10}ClN$	Trimethylamine hydrochloride..	25	0-6	(55)	$C_5H_8O_4$	Citraconic acid.....	15-25	47.4	(87)
$C_4H_4O_4$	Fumaric acid.....	15	1-9	(55)			27.7	7	(56)
$C_4H_4O_4$	Maleic acid.....	15, 20, 25	0.3	(121)	$C_5H_8O_4$	Itaconic acid.....	24, 25	2.6, 4.2	(56)
$C_4H_5Cl_3O_2$	Trichlorobutyric acid.....	20	44.6	(87)			25	1-2	(102)
$C_4H_6O_2$	Crotonic acid.....	25	15, 18	(64)	$C_5H_8O_4$	Mesaconic acid.....	28	3.7	(56)
$C_4H_6O_3$	Acetic anhydride.....	0, 18	4	(56)	$C_5H_8O_2$	Allyl acetate.....	15	1.2	(121)
$C_4H_6O_4$	Methyl oxalate.....	15	50-100	(30)	$C_5H_8O_4$	Glutaric acid.....	4, 15, 25	42.3	(87)
$C_4H_6O_4$	Succinic acid.....	20	0-1.5	(121)	$C_5H_8O_4$	Methylsuccinic acid.....	25	1.1-3.2	(102)
		15	5.9	(82)	$C_5H_{10}O$	Diethyl ketone.....	10-71	2.2, 4.8	(113)
		15	2, 4.7	(35)	$C_5H_{10}O_2$	<i>n</i> -Valeric acid.....	18	0-2.5	(52)
		15	1.7, 3.3	(121)			25	87, 98	(19)
$C_4H_6O_5$	Malic acid.....	20	8-70	(109)			15	84-100	(39, 40)
		20	1.7-24	(41)	$C_5H_{10}O_2$	Isovaleric acid.....	15	1.3, 2.5	(121)
		20	6.7	(82)			20	2, 4, 100	(120)
		25	16	(100)			25	89, 99	(19)
		9-45	17	(11.5)	$C_5H_{10}O_2$	Ethyl propionate.....	15	0.6, 1.3	(121)
$C_4H_6O_5$	Diglycolic acid.....	20	5-50	(58)	$C_5H_{10}O_2$	Propyl acetate.....	15	1.3	(121)
		15-20	3.7-33	(106)	$C_5H_{12}O$	<i>sec.</i> -Amyl alcohol.....	20	89.8-100	(12)
		15	4-15	(35)			8-74	3, 94	(113)
		18	4-45	(119)			15	1-2	(120)
		20	1-60	(94)	$C_5H_{12}O$	Isoamyl alcohol.....	15.5	90-96	(33)
$C_4H_6O_6$	Tartaric acid.....	20	1-15	(64)			20	0-3.3	(22)
		20	4	(80)	$C_5H_{12}O$	Dimethyl ethyl carbinol.....	15	1-4.4	(121)
		25	7, 18	(100)	$C_5H_{13}N$	Amylamine.....	20	5.8, 6.6	(64)
		15	0.4	(121)	$C_5H_{14}ClN$	Amylamine hydrochloride.....	20	3.8, 6.6	(64)
		20-90	0.5, 1.9	(13)	C_6H_6O	Phenol.....	15-90	0-6	(138)
$C_4H_7NO_4$	Aspartic acid.....	20	1.2-2.8	(5)			38-80	9.5-65	(36)
$C_4H_8O_2$	Methyl propionate.....	15	1-4.4	(121)	$C_6H_6O_2$	Catechol.....	20	5.5	(126)
$C_4H_8O_2$	Propyl formate.....	15	1, 2.2	(121)	$C_6H_6O_2$	Hydroquinol.....	20	5.5	(126)
		0	11-71	(11)	$C_6H_6O_2$	Resorcinol.....	0-85	Satd. sol.	(116)
		0	98-100	(140)	$C_6H_6O_2$	Pyrogallol.....	20	6.3	(126)
		15	83-100	(39, 40)	$C_6H_6O_3$		13-97	3, 95	(113)
$C_4H_8O_2$	<i>n</i> -Butyric acid.....	16	12-35	(51)	C_6H_7N	Aniline.....	15-80	0-3.3	(138)
		18	10, 19, 36	(44)				vol. %	
		20	30-100	(124)	C_6H_8ClN	Aniline hydrochloride.....	25	22	(114)
		20	8.8	(82)			12	4-36	(106)
		20	76-90	(62)			15	1.9	(35)
$C_4H_8O_2$	Isobutyric acid.....	15	72-87	(48)	$C_6H_8O_7$	Citric acid.....	20	1-26	(94)
		20	5-20	(120)			20	7	(82)
		20	8.8	(82)			25	8.7	(100)
		20	13, 17	(64)	$C_6H_{10}O_3$	Ethyl acetoacetate.....	14-72	3-10	(113)
		0-40	6.6-10,	(76)	$C_6H_{10}O_4$	Ethylene glycol diacetate.....	16-74	5-81	(113)
$C_4H_8O_2$	Ethyl acetate.....	15	Satd. sol.	(113)	$C_6H_{10}O_4$	Ethyl oxalate.....	17-74	1.8, 4.6	(113)
		17-63	4, 7.6, 96	(113)	$C_6H_{10}O_6$	Methyl tartrate.....	16-79	5-75	(113)
$C_4H_8NO_2$	Succinamide.....	0-84	0-4.4	(121)	$C_6H_{12}O_2$	Propyl propionate.....	15	0.4	(121)
$C_4H_8O_3$	Hydroxyisobutyric acid.....	15	1.3-5	(121)			15	1.6-6.6	(121)
$C_4H_8N_2O_3$	Asparagine.....	20	0-1.4	(5)	$C_6H_{12}O_3$	Paraldehyde.....	16-70	1.3, 6.4,	(113)
C_4H_9NO	Butyramide.....	25	7.7	(56)			19, 22	5.7, 7.7	(56)
		25	1-18	(23)	$C_6H_{12}O_5$	Quercitol.....	20	9	(126)
$C_4H_{10}O$	Ethyl ether.....	0	8.7	(31)	$C_6H_{14}O_6$	Mannitol.....	25	1.7-13.7	(55)
		15-75	12, 99	(16)	$C_6H_{16}ClN$	Triethylamine hydrochloride....	11-95	2, 95	(113)
			1.5-10 %	(138)	C_7H_8O	<i>m</i> -Cresol.....	20	10, 18	(56)
$C_4H_{10}O$	Isobutyl alcohol.....	20	vol.	(22)	$C_7H_{12}O_6$	Quinic acid.....	25	5.3	(100)
		20	2-8	(22)			25	0.7	(101)
		20	82-95	(130)	$C_8H_6O_4$	<i>o</i> -Phthalic acid.....	25	0.6	(100)
		25	2-5,	(130)	$C_8H_8O_2$	Phenylacetic acid.....	25	0-19	(15)
			82-95		$C_8H_{10}O_8$	Diacetyltartaric acid.....	25	50-75	(143, 144)
					$C_8H_{14}O_6$	Ethyl tartrate.....	13-99	2-16	(55)
					$C_8H_{20}ClN$	Tetraethylammonium chloride..	25		

Formula	Name	Range, °C	Range, p_s	Lit.
C_9H_7N	Quinoline.....	8-95	82, 89, 95	(113)
$C_9H_{13}NO_3S$	Trimethylsulfanilic acid.....	25	0-2	(57)
$C_{10}H_9O_3S$	β -Naphthalenesulfonic acid.....	30	57	(73)
$C_{10}H_{14}N_2$	Nicotine.....	0-40	7-51	(135)
		20	9-100	(65)
		20	33-86	(123)
$C_{10}H_{16}O_4$	Camphoric acid.....	74	69.2	(48)
$C_{11}H_{12}N_2O$	Antipyrine.....	21	1	(56)
		20	9.3	(126)

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DENSITY OF CERTAIN AQUEOUS ORGANIC SOLUTIONS

H. W. BEARCE, GRACE C. MULLIGAN AND MERRIEL P. MASLIN

A. SOLUTIONS CONTAINING ONE SOLUTE ONLY.
AQUEOUS SOLUTIONS OF METHYL, ETHYL,
AND PROPYL ALCOHOLS, GLYCEROL AND
FORMIC AND ACETIC ACIDSAll compositions are in Wt. % in vacuo. All density values are d_4^t = g/ml in vacuo.CH₃OH, METHYL ALCOHOL

v. also (1, 11, 13, 19, 20, 31, 35, 42, 46, 49, 51, 65, 67, 78, 79, 80, 81, 83, 86, 88)

%	0 (15)	10 (15)	15.56 (15)	20 (15)	15 (17)
0	0.9999	0.9997	0.9990	0.9982	0.99913
1	.9981	.9980	.9973	.9965	.99727
2	.9963	.9962	.9955	.9948	.99543
3	.9946	.9945	.9938	.9931	.99370
4	.9930	.9929	.9921	.9914	.99198
5	.9914	.9912	.9904	.9896	.99029
6	.9899	.9896	.9889	.9880	.98864
7	.9884	.9881	.9872	.9863	.98701
8	.9870	.9865	.9857	.9847	.98547

%	0 (15)	10 (15)	15.56 (15)	20 (15)	15 (17)
9	0.9856	0.9849	0.9841	0.9831	0.98394
10	.9842	.9834	.9826	.9815	.98241
11	.9829	.9820	.9811	.9799	.98093
12	.9816	.9805	.9796	.9784	.97945
13	.9804	.9791	.9781	.9768	.97802
14	.9792	.9778	.9766	.9754	.97660
15	.9780	.9764	.9752	.9740	.97518
16	.9769	.9751	.9738	.9725	.97377
17	.9758	.9739	.9723	.9710	.97237
18	.9747	.9726	.9709	.9696	.97096
19	.9736	.9713	.9695	.9681	.96955
20	.9725	.9700	.9680	.9666	.96814
21	.9714	.9687	.9666	.9651	.96673
22	.9702	.9673	.9652	.9636	.96533
23	.9690	.9660	.9638	.9622	.96392
24	.9678	.9646	.9624	.9607	.96251

CH₃OH, METHYL ALCOHOL.—(Continued)

$\frac{^{\circ}\text{C}}{\%}$	0 (15)	10 (15)	15.56 (15)	20 (15)	15 (17)
25	0.9666	0.9632	0.9609	0.9592	0.96108
26	.9654	.9618	.9595	.9576	.95963
27	.9642	.9604	.9580	.9562	.95817
28	.9629	.9590	.9565	.9546	.95668
29	.9616	.9575	.9550	.9531	.95518
30	.9604	.9560	.9535	.9515	.95366
31	.9590	.9546	.9521	.9499	.95213
32	.9576	.9531	.9505	.9483	.95056
33	.9563	.9516	.9489	.9466	.94896
34	.9549	.9500	.9473	.9450	.94734
35	.9534	.9484	.9456	.9433	.94570
36	.9520	.9469	.9440	.9416	.94404
37	.9505	.9453	.9422	.9398	.94237
38	.9490	.9437	.9405	.9381	.94067
39	.9475	.9420	.9387	.9363	.93894
40	.9459	.9403	.9369	.9345	.93720
41	.9443	.9387	.9351	.9327	.93543
42	.9427	.9370	.9333	.9309	.93365
43	.9411	.9352	.9315	.9290	.93185
44	.9395	.9334	.9297	.9272	.93001
45	.9377	.9316	.9279	.9252	.92815
46	.9360	.9298	.9261	.9234	.92627
47	.9342	.9279	.9242	.9214	.92436
48	.9324	.9260	.9223	.9196	.92242
49	.9306	.9240	.9204	.9176	.92048
50	.9287	.9221	.9185	.9156	.91852
51	.9269	.9202	.9166	.9135	.91653
52	.9250	.9182	.9146	.9114	.91451
53	.9230	.9162	.9126	.9094	.91248
54	.9211	.9142	.9106	.9073	.91044
55	.9191	.9122	.9086	.9052	.90839
56	.9172	.9101	.9065	.9032	.90631
57	.9151	.9080	.9045	.9010	.90421
58	.9131	.9060	.9024	.8988	.90210
59	.9111	.9039	.9002	.8968	.89996
60	.9090	.9018	.8980	.8946	.89781
61	.9068	.8998	.8958	.8924	.89563
62	.9046	.8977	.8936	.8902	.89341
63	.9024	.8955	.8913	.8879	.89117
64	.9002	.8933	.8890	.8856	.88890
65	.8980	.8911	.8867	.8834	.88662
66	.8958	.8888	.8844	.8811	.88433
67	.8935	.8865	.8820	.8787	.88203
68	.8913	.8842	.8797	.8763	.87971
69	.8891	.8818	.8771	.8738	.87739
70	.8869	.8794	.8748	.8715	.87507
71	.8847	.8770	.8726	.8690	.87271
72	.8824	.8747	.8702	.8665	.87033
73	.8801	.8724	.8678	.8641	.86792
74	.8778	.8699	.8653	.8616	.86546
75	.8754	.8676	.8629	.8592	.86300
76	.8729	.8651	.8604	.8567	.86051
77	.8705	.8626	.8579	.8542	.85801

$\frac{^{\circ}\text{C}}{\%}$	0 (15)	10 (15)	15.56 (15)	20 (15)	15 (17)
78	0.8680	0.8602	0.8554	0.8518	0.85551
79	.8657	.8577	.8529	.8494	.85300
80	.8634	.8551	.8503	.8469	.85048
81	.8610	.8527	.8478	.8446	.84794
82	.8585	.8501	.8452	.8420	.84536
83	.8560	.8475	.8426	.8394	.84274
84	.8535	.8449	.8400	.8366	.84009
85	.8510	.8422	.8374	.8340	.83742
86	.8483	.8394	.8347	.8314	.83475
87	.8456	.8367	.8320	.8286	.83207
88	.8428	.8340	.8294	.8258	.82937
89	.8400	.8314	.8267	.8230	.82667
90	.8374	.8287	.8239	.8202	.82396
91	.8347	.8261	.8212	.8174	.82124
92	.8320	.8234	.8185	.8146	.81849
93	.8293	.8208	.8157	.8118	.81568
94	.8266	.8180	.8129	.8090	.81285
95	.8240	.8152	.8101	.8062	.80999
96	.8212	.8124	.8073	.8034	.80713
97	.8186	.8096	.8045	.8005	.80428
98	.8158	.8068	.8016	.7976	.80143
99	.8130	.8040	.7987	.7948	.79859
100	.8102	.8009	.7959	.7917	.79577

C₂H₅OH, ETHYL ALCOHOL (5)

For bibliography, *v.* (56); *v. also* (3, 6, 7, 14, 23, 31, 35, 38, 39, 49, 50, 51, 64, 67, 71, 74, 83, 87)

$\frac{^{\circ}\text{C}}{\%}$	10	15	20	25	30	35	40
0	0.99973	0.99913	0.99823	0.99708	0.99568	0.99406	0.99225
1	785	725	636	520	379	217	034
2	602	542	453	336	194	031	.98846
3	426	365	275	157	014	.98849	663
4	258	195	103	.98984	.98839	672	485
5	098	032	.98938	817	670	501	311
6	.98946	.98877	780	656	507	335	142
7	801	729	627	500	347	172	.97975
8	660	584	478	346	189	009	808
9	524	442	331	193	031	.97846	641
10	393	304	187	043	.97875	685	475
11	267	171	047	.97897	723	527	312
12	145	041	.97910	753	573	371	150
13	026	.97914	775	611	424	216	.96989
14	.97911	790	643	472	278	063	829
15	800	669	514	334	133	.96911	670
16	692	552	387	199	.96990	760	512
17	583	433	259	062	844	607	352
18	473	313	129	.96923	697	452	189
19	363	191	.96997	782	547	294	023
20	252	068	864	639	395	134	.95856
21	139	.96944	729	495	242	.95973	687
22	024	818	592	348	087	809	516
23	.96907	689	453	199	.95929	643	343
24	787	558	312	048	769	476	168

C₂H₅OH, ETHYL ALCOHOL (5).—(Continued)

°C %	10	15	20	25	30	35	40
25	0.96665	0.96424	0.96168	0.95895	0.95607	0.95306	0.94991
26	539	287	020	738	442	133	810
27	406	144	.95867	576	272	.94955	625
28	268	.95996	710	410	098	774	438
29	125	844	548	241	.94922	590	248
30	.95977	686	382	067	741	403	055
31	823	524	212	.94890	557	214	.93860
32	665	357	038	709	370	021	662
33	502	186	.94860	525	180	.93825	461
34	334	011	679	337	.93986	626	257
35	162	.94832	494	146	790	425	051
36	.94986	650	306	.93952	591	221	.92843
37	805	464	114	756	390	016	634
38	620	273	.93919	556	186	.92808	422
39	431	079	720	353	.92979	597	208
40	238	.93882	518	148	770	385	.91992
41	042	682	314	.92940	558	170	774
42	.93842	478	107	729	344	.91952	554
43	639	271	.92897	516	128	733	332
44	433	062	685	301	.91910	513	108
45	226	.92852	472	085	692	291	.90884
46	017	640	257	.91868	472	069	660
47	.92806	426	041	649	250	.90845	434
48	593	211	.91823	429	028	621	207
49	379	.91995	604	208	.90805	396	.89979
50	162	776	384	.90985	580	168	750
51	.91943	555	160	760	353	.89940	519
52	723	333	.90936	534	125	710	288
53	502	110	711	307	.89896	479	056
54	279	.90885	485	079	667	248	.88823
55	055	659	258	.89850	437	016	589
56	.90831	433	031	621	206	.88784	356
57	607	207	.89803	392	.88975	552	122
58	381	.89980	574	162	744	319	.87888
59	154	752	344	.88931	512	085	653
60	.89927	523	113	699	278	.87851	417
61	698	293	.88882	466	044	615	180
62	468	062	650	233	.87809	379	.86943
63	237	.88830	417	.87998	574	142	705
64	006	597	183	763	337	.86905	466
65	.88774	364	.87948	527	100	667	227
66	541	130	713	291	.86863	429	.85987
67	308	.87895	477	054	625	190	747
68	074	660	241	.86817	387	.85950	507
69	.87839	424	004	579	148	710	266
70	602	187	.86766	340	.85908	470	025
71	365	.86949	527	100	667	228	.84783
72	127	710	287	.85859	426	.84986	540
73	.86888	470	047	618	184	743	297
74	648	229	.85806	376	.84941	500	053
75	408	.85988	564	134	698	257	.83809
76	168	747	322	.84891	455	013	564
77	.85927	505	079	647	211	.83768	319

°C %	10	15	20	25	30	35	40
78	0.85685	0.85262	0.84835	0.84403	0.83966	0.83523	0.83074
79	442	018	590	158	720	277	.82827
80	197	.84772	344	.83911	473	029	578
81	.84950	525	096	664	224	.82780	329
82	702	277	.83848	415	.82974	530	079
83	453	028	599	164	724	279	.81828
84	203	.83777	348	.82913	473	027	576
85	.83951	525	095	660	220	.81774	322
86	697	271	.82840	405	.81965	519	067
87	441	014	583	148	708	262	.80811
88	181	.82754	323	.81888	448	003	552
89	.82919	492	062	626	186	.80742	291
90	654	227	.81797	362	.80922	478	028
91	386	.81959	529	094	655	211	.79761
92	114	688	257	.80823	384	.79941	491
93	.81839	413	.80983	549	111	669	220
94	561	134	705	272	.79835	393	.78947
95	278	.80852	424	.79991	555	114	670
96	.80991	566	138	706	271	.78831	388
97	698	274	.79846	415	.78981	542	100
98	399	.79975	547	117	684	247	.77806
99	094	670	243	.78814	382	.77946	507
100	.79784	360	.78934	506	075	641	203

DENSITY (G/ML) OF MIXTURES OF C₂H₅OH AND H₂O AT 20°C

* indicates change in the first two decimal places

% alcohol by weight	Tenths of %									
	0	1	2	3	4	5	6	7	8	9
0	0.99823	804	785	766	748	729	710	692	673	655
1	636	618	599	581	562	544	525	507	489	471
2	453	435	417	399	381	363	345	327	310	292
3	275	257	240	222	205	188	171	154	137	120
4	103	087	070	053	037	020	003	*987	*971	*954
5	.98938	922	906	890	874	859	843	827	811	796
6	780	765	749	734	718	703	688	673	658	642
7	627	612	597	582	567	553	538	523	508	493
8	478	463	449	434	419	404	389	374	360	345
9	331	316	301	287	273	258	244	229	215	201
10	187	172	158	144	130	117	103	089	075	061
11	047	033	019	006	*992	*978	*964	*951	*937	*923
12	.97910	896	883	869	855	842	828	815	801	788
13	775	761	748	735	722	709	696	683	670	657
14	643	630	617	604	591	578	565	552	539	526
15	514	501	488	475	462	450	438	425	412	400
16	387	374	361	349	336	323	310	297	284	272
17	259	246	233	220	207	194	181	168	155	142
18	129	116	103	089	076	063	050	037	024	010
19	.96997	984	971	957	944	931	917	904	891	877
20	864	850	837	823	810	796	783	769	756	742
21	729	716	702	688	675	661	647	634	620	606
22	592	578	564	551	537	523	509	495	481	467
23	453	439	425	411	396	382	368	354	340	326
24	312	297	283	269	254	240	225	211	196	182

DENSITY (G/ML) OF MIXTURES OF C_2H_5OH AND H_2O AT $20^\circ C$. —
(Continued)

% alcohol by weight	Tenths of %									
	0	1	2	3	4	5	6	7	8	9
25	0.96168	153	139	124	109	094	080	065	050	035
26	020	005	*990	*975	*959	*944	*929	*914	*898	*883
27	.95867	851	836	820	805	789	773	757	742	726
28	710	694	678	662	646	630	613	597	581	565
29	548	532	516	499	483	466	450	433	416	400
30	382	365	349	332	315	298	281	264	247	230
31	212	195	178	161	143	126	108	091	074	056
32	038	020	003	*985	*967	*950	*932	*914	*896	*878
33	.94860	842	824	806	788	770	752	734	715	697
34	679	660	642	624	605	587	568	550	531	512
35	494	475	456	438	419	400	382	363	344	325
36	306	287	268	249	230	211	192	172	153	134
37	114	095	075	056	036	017	*997	*978	*958	*939
38	.93919	899	879	859	840	820	800	780	760	740
39	720	700	680	660	640	620	599	579	559	539
40	518	498	478	458	437	417	396	376	356	335
41	314	294	273	253	232	212	191	170	149	129
42	107	086	065	044	023	002	*981	*960	*939	*918
43	.92897	876	855	834	812	791	770	749	728	707
44	685	664	642	621	600	579	557	536	515	493
45	472	450	429	408	386	365	343	322	300	279
46	257	236	214	193	171	150	128	106	085	063
47	041	019	*997	*976	*954	*932	*910	*889	*867	*845
48	.91823	801	780	758	736	714	692	670	648	626
49	604	582	560	538	516	494	472	450	428	406
50	384	361	339	317	295	272	250	228	206	183
51	160	138	116	093	071	049	026	004	*981	*959
52	.90936	914	891	869	846	824	801	779	756	734
53	711	689	666	644	621	598	576	553	531	508
54	485	463	440	417	395	372	349	327	304	281
55	258	236	213	190	167	145	122	099	076	054
56	031	008	*985	*962	*939	*917	*894	*871	*848	*825
57	.89803	780	757	734	711	688	665	643	620	597
58	574	551	528	505	482	459	436	413	390	367
59	344	321	298	275	252	229	206	183	160	137
60	113	090	067	044	021	*998	*975	*951	*928	*905
61	.88882	859	836	812	789	766	743	720	696	673
62	650	626	603	580	557	533	510	487	463	440
63	417	393	370	347	323	300	277	253	230	206
64	183	160	136	113	089	066	042	019	*995	*972
65	.87948	925	901	878	854	831	807	784	760	737
66	713	689	666	642	619	595	572	548	524	501
67	477	454	430	406	383	359	336	312	288	265
68	241	218	194	170	147	123	099	075	052	028
69	004	*981	*957	*933	*909	*885	*862	*838	*814	*790
70	.86766	742	718	694	671	647	623	599	575	551
71	527	503	479	455	431	407	383	359	335	311
72	287	263	239	215	191	167	143	119	095	071
73	047	022	*998	*974	*950	*926	*902	*878	*854	*830
74	.85806	781	757	733	709	685	661	636	612	588

% alcohol by weight	Tenths of %									
	0	1	2	3	4	5	6	7	8	9
75	0.85564	540	515	491	467	443	419	394	370	346
76	322	297	273	249	225	200	176	152	128	103
77	079	055	031	006	*982	*958	*933	*909	*884	*860
78	.84835	811	787	762	738	713	689	664	640	615
79	590	566	541	517	492	467	443	418	393	369
80	344	319	294	270	245	220	196	171	146	121
81	096	072	047	022	*997	*972	*947	*923	*898	*873
82	.83848	823	798	773	748	723	698	674	649	624
83	599	574	549	523	498	473	448	423	398	373
84	348	323	297	272	247	222	196	171	146	120
85	095	070	044	019	*994	*968	*943	*917	*892	*866
86	.82840	815	789	763	738	712	686	660	635	609
87	583	557	531	505	479	453	427	401	375	349
88	323	297	271	245	219	193	167	140	114	088
89	062	035	009	*983	*956	*930	*903	*877	*850	*824
90	.81797	770	744	717	690	664	637	610	583	556
91	529	502	475	448	421	394	366	339	312	285
92	257	230	203	175	148	120	093	066	038	010
93	.80983	955	928	900	872	844	817	789	761	733
94	705	677	649	621	593	565	537	509	480	452
95	424	395	367	338	310	281	253	224	195	166
96	138	109	080	051	022	*993	*963	*934	*905	*875
97	.79846	816	787	757	727	698	668	638	608	578
98	547	517	487	456	426	396	365	335	305	274
99	243	213	182	151	120	089	059	028	*997	*966
100	.78934									

SPECIFIC GRAVITY AT $60/60^\circ F$ ($15.56/15.56^\circ C$) OF MIXTURES (BY VOLUME) OF C_2H_5OH AND H_2O

*indicates change in first two decimal places. See next line, column 0

% alcohol by volume at $60^\circ F$	Tenths of %									
	0	1	2	3	4	5	6	7	8	9
0	1.00000	*985	*970	*955	*940	*925	*910	*895	*880	*865
1	0.99850	835	820	806	791	776	761	747	732	717
2	703	688	674	659	645	630	616	602	587	573
3	559	545	531	516	502	488	474	460	446	432
4	419	405	391	378	364	350	336	323	309	296
5	282	269	255	242	228	215	202	189	176	163
6	150	137	124	111	098	085	073	060	047	035
7	022	009	*997	*984	*972	*960	*947	*935	*923	*911
8	.98899	887	875	863	851	838	826	814	803	791
9	779	767	755	743	731	720	708	696	684	672
10	661	649	637	625	614	602	590	579	567	556
11	544	532	521	509	498	487	475	464	452	441
12	430	419	408	396	385	374	363	352	341	330
13	319	308	297	286	275	264	254	243	232	221
14	210	200	190	179	168	157	147	136	125	115
15	104	093	083	072	062	051	040	030	019	009
16	.97998	988	977	967	956	946	936	925	915	905
17	895	885	875	864	854	844	834	824	814	804
18	794	784	774	764	754	744	734	724	714	704
19	694	684	674	664	654	645	635	625	615	605

SPECIFIC GRAVITY AT 60/60°F (15.56/15.56°C) OF MIXTURES (BY VOLUME) OF C₂H₅OH AND H₂O.—(Continued)

% alcohol by volume at 60°F	Tenths of %									
	0	1	2	3	4	5	6	7	8	9
20	0.97596	586	576	566	556	546	536	526	516	506
21	496	486	476	466	456	446	436	425	415	405
22	395	385	375	365	354	344	334	324	313	303
23	293	283	272	262	252	241	231	221	210	200
24	189	179	168	158	147	137	126	116	105	095
25	084	073	063	052	042	031	020	010	*999	*988
26	.96978	967	957	946	935	924	914	903	892	881
27	870	859	848	837	826	815	804	793	782	771
28	760	749	738	727	715	704	693	682	671	659
29	648	637	625	614	603	591	580	568	557	546
30	534	522	511	499	488	476	464	453	441	429
31	418	406	394	382	370	358	346	334	321	309
32	296	284	271	259	246	234	221	209	196	183
33	170	157	144	132	119	106	093	080	067	054
34	041	028	015	002	*988	*975	*962	*948	*935	*921
35	.95908	894	881	867	854	840	826	812	798	784
36	770	756	742	728	714	700	685	671	657	643
37	628	614	599	585	570	556	541	526	512	497
38	482	467	452	437	423	408	393	378	362	347
39	332	317	302	286	271	256	240	225	209	194
40	178	162	147	131	115	100	084	068	052	036
41	020	004	*988	*972	*956	*940	*923	*907	*891	*875
42	.94858	842	825	809	792	776	759	743	726	710
43	693	676	660	643	626	609	592	575	558	541
44	524	507	490	473	455	438	421	403	386	369
45	351	334	316	298	281	263	245	228	210	192
46	174	156	138	120	102	084	066	048	030	011
47	.93993	975	956	938	920	901	883	864	845	827
48	808	789	771	752	733	714	695	676	657	638
49	619	600	581	562	543	523	504	485	465	446
50	426	407	387	368	348	328	309	289	270	250
51	230	210	190	171	151	131	111	091	071	051
52	031	011	*991	*971	*951	*931	*911	*890	*870	*850
53	.92830	810	789	769	749	728	708	688	667	647
54	626	605	585	564	544	523	502	482	461	440
55	419	398	377	357	336	315	294	273	252	231
56	210	189	168	147	126	105	084	062	041	020
57	.91999	978	956	935	914	892	871	849	827	806
58	784	762	741	719	697	675	653	631	610	588
59	565	543	521	499	477	455	433	410	388	366
60	344	322	299	277	255	232	210	188	165	143
61	120	097	075	052	030	007	*984	*962	*939	*916
62	.90893	870	847	825	802	779	756	733	710	687
63	664	641	618	595	572	549	526	503	480	457
64	434	411	388	365	341	318	295	272	249	225
65	202	179	155	132	108	085	061	038	014	*991
66	.89967	943	920	896	872	848	825	801	777	753
67	729	705	681	657	633	609	585	561	537	513
68	489	465	441	416	392	368	343	319	295	270
69	245	220	196	171	147	122	098	073	048	024
70	.88999	974	950	925	900	875	850	825	801	776
71	751	725	700	675	650	625	600	574	549	524

% alcohol by volume at 60°F	Tenths of %									
	0	1	2	3	4	5	6	7	8	9
72	0.88499	474	448	423	397	372	346	321	296	270
73	244	218	193	167	141	116	090	064	039	013
74	.87987	961	935	910	884	858	832	806	780	754
75	728	702	676	650	623	597	571	545	518	492
76	465	439	412	386	359	332	306	279	252	226
77	199	172	145	118	092	065	038	011	*984	*957
78	.86929	902	875	847	820	793	766	738	711	684
79	656	629	601	574	546	518	491	463	435	408
80	380	352	324	296	269	241	213	185	157	129
81	100	072	044	015	*987	*959	*931	*902	*874	*846
82	.85817	789	760	732	703	674	646	617	588	560
83	531	502	473	444	415	386	357	328	299	270
84	240	211	181	152	122	093	063	033	004	*974
85	.84944	914	884	854	824	794	764	734	703	673
86	642	612	581	551	520	490	459	428	398	367
87	336	305	274	243	212	181	150	119	088	056
88	025	*994	*962	*930	*899	*867	*835	*803	*771	*739
89	.83707	675	643	610	578	545	513	480	447	415
90	382	349	315	282	249	216	183	150	116	083
91	049	015	*981	*947	*913	*879	*845	*810	*776	*741
92	.82705	670	635	600	565	529	494	458	423	387
93	351	315	279	243	206	170	133	096	059	022
94	.81984	947	909	871	834	796	757	719	681	642
95	603	564	525	486	446	407	367	327	287	247
96	206	165	125	084	042	001	*960	*918	*876	*834
97	.80792	750	707	664	620	577	533	489	445	401
98	356	311	265	219	173	127	080	033	*985	*937
99	.79889	841	792	743	693	643	593	543	492	441
100	389									

For detailed interpolation tables of temperature corrections to readings of alcoholometers (standard at 60°F) v. (5).

C₃H₇OH, *n*-PROPYL ALCOHOL (82)

% / °C	°C			% / °C	°C		
	0	15	30		0	15	30
0	0.9999	0.9991	0.9957	17	0.9817	0.9768	0.9698
1	0.9982	0.9974	0.9940	18	0.9808	0.9752	0.9680
2	0.9967	0.9960	0.9924	19	0.9800	0.9739	0.9661
3	0.9952	0.9944	0.9908	20	0.9789	0.9723	0.9643
4	0.9939	0.9929	0.9893	21	0.9776	0.9705	0.9622
5	0.9926	0.9915	0.9877	22	0.9763	0.9688	0.9602
6	0.9914	0.9902	0.9862	23	0.9748	0.9670	0.9583
7	0.9904	0.9890	0.9848	24	0.9733	0.9651	0.9563
8	0.9894	0.9877	0.9834	25	0.9717	0.9633	0.9543
9	0.9883	0.9864	0.9819	26	0.9700	0.9614	0.9522
10	0.9874	0.9852	0.9804	27	0.9682	0.9594	0.9501
11	0.9865	0.9840	0.9790	28	0.9664	0.9576	0.9481
12	0.9857	0.9828	0.9775	29	0.9646	0.9556	0.9460
13	0.9849	0.9817	0.9760	30	0.9627	0.9535	0.9439
14	0.9841	0.9806	0.9746	31	0.9608	0.9516	0.9418
15	0.9833	0.9793	0.9730	32	0.9589	0.9495	0.9396
16	0.9825	0.9780	0.9714	33	0.9570	0.9474	0.9375

C₃H₇OH, *n*-PROPYL ALCOHOL.—(Continued)

°C				°C			
%	0	15	30	%	0	15	30
34	0.9550	0.9454	0.9354	68	0.8874	0.8759	0.8641
35	0.9530	0.9434	0.9333	69	0.8854	0.8739	0.8620
36	0.9511	0.9413	0.9312	70	0.8835	0.8719	0.8600
37	0.9491	0.9392	0.9289	71	0.8815	0.8700	0.8580
38	0.9471	0.9372	0.9269	72	0.8795	0.8680	0.8559
39	0.9450	0.9351	0.9247	73	0.8776	0.8659	0.8539
40	0.9430	0.9331	0.9226	74	0.8756	0.8639	0.8518
41	0.9411	0.9310	0.9205	75	0.8736	0.8618	0.8497
42	0.9391	0.9290	0.9184	76	0.8716	0.8598	0.8477
43	0.9371	0.9269	0.9164	77	0.8695	0.8577	0.8456
44	0.9352	0.9248	0.9143	78	0.8675	0.8556	0.8435
45	0.9332	0.9228	0.9122	79	0.8655	0.8536	0.8414
46	0.9311	0.9207	0.9100	80	0.8634	0.8516	0.8394
47	0.9291	0.9186	0.9079	81	0.8614	0.8496	0.8373
48	0.9272	0.9165	0.9057	82	0.8594	0.8475	0.8352
49	0.9252	0.9145	0.9036	83	0.8574	0.8454	0.8332
50	0.9232	0.9124	0.9015	84	0.8554	0.8434	0.8311
51	0.9213	0.9104	0.8994	85	0.8534	0.8413	0.8290
52	0.9192	0.9084	0.8973	86	0.8513	0.8393	0.8269
53	0.9173	0.9064	0.8952	87	0.8492	0.8372	0.8248
54	0.9153	0.9044	0.8931	88	0.8471	0.8351	0.8227
55	0.9132	0.9023	0.8911	89	0.8450	0.8330	0.8206
56	0.9112	0.9003	0.8890	90	0.8429	0.8308	0.8185
57	0.9093	0.8983	0.8869	91	0.8408	0.8287	0.8164
58	0.9073	0.8963	0.8849	92	0.8387	0.8266	0.8142
59	0.9053	0.8942	0.8828	93	0.8364	0.8244	0.8120
60	0.9033	0.8922	0.8807	94	0.8342	0.8221	0.8098
61	0.9013	0.8902	0.8786	95	0.8320	0.8199	0.8077
62	0.8994	0.8882	0.8766	96	0.8296	0.8176	0.8054
63	0.8974	0.8861	0.8745	97	0.8272	0.8153	0.8031
64	0.8954	0.8841	0.8724	98	0.8248	0.8128	0.8008
65	0.8934	0.8820	0.8703	99	0.8222	0.8104	0.7984
66	0.8913	0.8800	0.8682	100	0.8194	0.8077	0.7958
67	0.8894	0.8779	0.8662				

DOROSHEVSKII AND ROZHDESTVENSKII'S VALUES AT 15°C (18);
v. also (1, 3, 13, 19, 23, 24, 45, 49, 52, 60, 61, 80, 81, 87, 89)

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
0	0.99913	15	0.97914	30	0.95318	45	0.92257
1	0.99745	16	0.97788	31	0.95118	46	0.92053
2	0.99580	17	0.97653	32	0.94917	47	0.91848
3	0.99430	18	0.97509	33	0.94715	48	0.91643
4	0.99283	19	0.97358	34	0.94513	49	0.91438
5	0.99141	20	0.97201	35	0.94312	50	0.91234
6	0.99004	21	0.97035	36	0.94109	51	0.91028
7	0.98874	22	0.96863	37	0.93906	52	0.90824
8	0.98748	23	0.96684	38	0.93702	53	0.90619
9	0.98626	24	0.96500	39	0.93497	54	0.90414
10	0.98507	25	0.96310	40	0.93290	55	0.90209
11	0.98390	26	0.96113	41	0.93080	56	0.90003
12	0.98273	27	0.95916	42	0.92876	57	0.89799
13	0.98156	28	0.95717	43	0.92669	58	0.89594
14	0.98037	29	0.95518	44	0.92463	59	0.89389

%	d_4^{15}	%	d_4^{15}	%	d_4^{15}	%	d_4^{15}
60	0.89184	70	0.87158	80	0.85126	90	0.83051
61	0.88980	71	0.86956	81	0.84921	91	0.82836
62	0.88777	72	0.86754	82	0.84716	92	0.82618
63	0.88576	73	0.86552	83	0.84511	93	0.82399
64	0.88373	74	0.86351	84	0.84306	94	0.82179
65	0.88170	75	0.86148	85	0.84101	95	0.81959
66	0.87967	76	0.85944	86	0.83896	96	0.81730
67	0.87764	77	0.85739	87	0.83688	97	0.81490
68	0.87562	78	0.85534	88	0.83478	98	0.81240
69	0.87360	79	0.85330	89	0.83266	99	0.80982
						100	0.80733

C₃H₇OH, ISOPROPYL ALCOHOL

v. also (1, 3, 21, 24, 77, 80, 81)

°C		0 (82)	15 (82)	15 (16)	20 (47)	30 (82)
%						
0		0.9999	0.9991	0.99913	0.9982	0.9957
1		0.9980	0.9973	0.9972	0.9962	0.9939
2		0.9962	0.9956	0.9954	0.9944	0.9921
3		0.9946	0.9938	0.9936	0.9926	0.9904
4		0.9930	0.9922	0.9920	0.9909	0.9887
5		0.9916	0.9906	0.9904	0.9893	0.9871
6		0.9902	0.9892	0.9890	0.9877	0.9855
7		0.9890	0.9878	0.9875	0.9862	0.9839
8		0.9878	0.9864	0.9862	0.9847	0.9824
9		0.9866	0.9851	0.9849	0.9833	0.9809
10		0.9856	0.9838	0.98362	0.9820	0.9794
11		0.9846	0.9826	0.9824	0.9808	0.9778
12		0.9838	0.9813	0.9812	0.9797	0.9764
13		0.9829	0.9802	0.9800	0.9786	0.9750
14		0.9821	0.9790	0.9788	0.9776	0.9735
15		0.9814	0.9779	0.9777	0.9765	0.9720
16		0.9806	0.9768	0.9765	0.9754	0.9705
17		0.9799	0.9756	0.9753	0.9743	0.9690
18		0.9792	0.9745	0.9741	0.9731	0.9675
19		0.9784	0.9730	0.9728	0.9717	0.9658
20		0.9777	0.9719	0.97158	0.9703	0.9642
21		0.9768	0.9704	0.9703	0.9688	0.9624
22		0.9759	0.9690	0.9689	0.9669	0.9606
23		0.9749	0.9675	0.9674	0.9651	0.9587
24		0.9739	0.9660	0.9659	0.9634	0.9569
25		0.9727	0.9643	0.9642	0.9615	0.9549
26		0.9714	0.9626	0.9624	0.9597	0.9529
27		0.9699	0.9608	0.9605	0.9577	0.9509
28		0.9684	0.9590	0.9586	0.9558	0.9488
29		0.9669	0.9570	0.9568	0.9540	0.9467
30		0.9652	0.9551	0.95493	0.9520	0.9446
31		0.9634		0.9530	0.9500	0.9426
32		0.9615		0.9510	0.9481	0.9405
33		0.9596		0.9489	0.9460	0.9383
34		0.9577		0.9468	0.9440	0.9361
35		0.9557		0.9446	0.9419	0.9338
36		0.9536		0.9424	0.9399	0.9315
37		0.9514		0.9401	0.9377	0.9292

C_3H_7OH , ISOPROPYL ALCOHOL.—(Continued)

$\frac{\text{°C}}{\text{°}}$	0 (82)	15 (82)	15 (16)	20 (47)	30 (82)
38	0.9493		0.9379	0.9355	0.9269
39	0.9472		0.9356	0.9333	0.9246
40	0.9450		0.9333 ₃	0.9310	0.9224
41	0.9428		0.9311	0.9287	0.9201
42	0.9406		0.9288	0.9264	0.9177
43	0.9384		0.9266	0.9239	0.9154
44	0.9361		0.9243	0.9215	0.9130
45	0.9338		0.9220	0.9191	0.9106
46	0.9315		0.9197	0.9165	0.9082
47	0.9292		0.9174	0.9141	0.9059
48	0.9270		0.9150	0.9117	0.9036
49	0.9247		0.9127	0.9093	0.9013
50	0.9224		0.9104 ₃	0.9069	0.8990
51	0.9201		0.9081	0.9044	0.8966
52	0.9178		0.9058	0.9020	0.8943
53	0.9155		0.9035	0.8996	0.8919
54	0.9132		0.9011	0.8971	0.8895
55	0.9109		0.8988	0.8946	0.8871
56	0.9086		0.8964	0.8921	0.8847
57	0.9063		0.8940	0.8896	0.8823
58	0.9040		0.8917	0.8874	0.8800
59	0.9017		0.8893	0.8850	0.8777
60	0.8994		0.8869 ₀	0.8825	0.8752
61	0.8970		0.8845	0.8800	0.8728
62	0.8947	0.8829	0.8821	0.8776	0.8704
63	0.8924	0.8805	0.8798	0.8751	0.8680
64	0.8901	0.8781	0.8775	0.8727	0.8656
65	0.8878	0.8757	0.8752	0.8702	0.8631
66	0.8854	0.8733	0.8728	0.8679	0.8607
67	0.8831	0.8710	0.8705	0.8656	0.8583
68	0.8807	0.8686	0.8682	0.8632	0.8559
69	0.8784	0.8662	0.8658	0.8609	0.8535
70	0.8761	0.8639	0.8634 ₆	0.8584	0.8511
71	0.8738	0.8615	0.8611	0.8560	0.8487
72	0.8714	0.8592	0.8588	0.8537	0.8464
73	0.8691	0.8568	0.8564	0.8513	0.8440
74	0.8668	0.8545	0.8541	0.8489	0.8416
75	0.8644	0.8521	0.8517	0.8464	0.8392
76	0.8621	0.8497	0.8493	0.8439	0.8368
77	0.8598	0.8474	0.8470	0.8415	0.8344
78	0.8575	0.8450	0.8446	0.8391	0.8321
79	0.8551	0.8426	0.8422	0.8366	0.8297
80	0.8528	0.8403	0.8397 ₉	0.8342	0.8273
81	0.8503	0.8379	0.8374	0.8317	0.8248
82	0.8479	0.8355	0.8350	0.8292	0.8224
83	0.8456	0.8331	0.8326	0.8268	0.8200
84	0.8432	0.8307	0.8302	0.8243	0.8175
85	0.8408	0.8282	0.8278	0.8219	0.8151
86	0.8384	0.8259	0.8254	0.8194	0.8127
87	0.8360	0.8234	0.8229	0.8169	0.8102
88	0.8336	0.8209	0.8205	0.8145	0.8078
89	0.8311	0.8184	0.8180	0.8120	0.8053

$\frac{\text{°C}}{\text{°}}$	0 (82)	15 (82)	15 (16)	20 (47)	30 (82)
90	0.8287	0.8161	0.8155 ₃	0.8096	0.8029
91	0.8262	0.8136	0.8130	0.8072	0.8004
92	0.8237	0.8110	0.8104	0.8047	0.7979
93	0.8212	0.8085	0.8079	0.8023	0.7954
94	0.8186	0.8060	0.8052	0.7998	0.7929
95	0.8160	0.8034	0.8026	0.7973	0.7904
96	0.8133	0.8008	0.7999	0.7949	0.7878
97	0.8106	0.7981	0.7972	0.7925	0.7852
98	0.8078	0.7954	0.7945	0.7901	0.7826
99	0.8048	0.7926	0.7918	0.7877	0.7799
100	0.8016	0.7896	0.7891 ₃	0.7854	0.7770

 $C_3H_8O_3$, GLYCEROL

$\frac{\text{°C}}{\text{°}}$	15 (27, 29, 32, 34, 48, 76, 90)	15.5 (90)	20 (27, 29, 48, 53, 54, 73, 86, 90)	25 (29, 48, 90)	30 (32, 48)
0	0.9991	0.9990	0.9982	0.9971	0.9957
1	1.0015	1.0014	1.0006	0.9994	0.9978
2	1.0040	1.0039	1.0030	1.0017	0.9999
3	1.0064	1.0063	1.0053	1.0041	1.0020
4	1.0088	1.0087	1.0077	1.0064	1.0042
5	1.0112	1.0111	1.0101	1.0088	1.0064
6	1.0136	1.0135	1.0125	1.0112	1.0086
7	1.0161	1.0159	1.0149	1.0135	1.0109
8	1.0185	1.0183	1.0173	1.0159	1.0133
9	1.0210	1.0208	1.0197	1.0183	1.0158
10	1.0234	1.0232	1.0221	1.0207	1.0183
11	1.0259	1.0257	1.0246	1.0232	1.0208
12	1.0284	1.0282	1.0271	1.0256	1.0232
13	1.0309	1.0307	1.0295	1.0280	1.0256
14	1.0334	1.0332	1.0320	1.0305	1.0281
15	1.0359	1.0357	1.0345	1.0329	1.0306
16	1.0384	1.0382	1.0370	1.0354	1.0331
17	1.0409	1.0407	1.0395	1.0379	1.0356
18	1.0435	1.0432	1.0420	1.0404	1.0380
19	1.0460	1.0458	1.0445	1.0429	1.0405
20	1.0486	1.0483	1.0470	1.0453	1.0430
21	1.0511	1.0509	1.0495	1.0477	1.0454
22	1.0536	1.0535	1.0520	1.0501	1.0479
23	1.0562	1.0561	1.0545	1.0525	1.0504
24	1.0588	1.0587	1.0571	1.0550	1.0529
25	1.0614	1.0613	1.0597	1.0575	1.0554
26	1.0640	1.0639	1.0622	1.0600	1.0579
27	1.0666	1.0665	1.0648	1.0626	1.0605
28	1.0692	1.0691	1.0674	1.0652	1.0631
29	1.0718	1.0717	1.0700	1.0679	1.0657
30	1.0744	1.0744	1.0727	1.0706	1.0683
31	1.0770	1.0770	1.0753	1.0732	1.0709
32	1.0797	1.0797	1.0780	1.0758	1.0735
33	1.0824	1.0824	1.0806	1.0785	1.0762
34	1.0851	1.0851	1.0833	1.0811	1.0788
35	1.0878	1.0878	1.0860	1.0837	1.0814
36	1.0905	1.0905	1.0887	1.0864	1.0840

C₃H₈O₃, GLYCEROL.—(Continued)

$\frac{^\circ\text{C}}{\%}$	15	15.5	20	25	30
37	1.0932	1.0932	1.0914	1.0890	1.0867
38	1.0959	1.0959	1.0941	1.0917	1.0894
39	1.0986	1.0986	1.0968	1.0944	1.0920
40	1.1013	1.1013	1.0995	1.0971	1.0947
41	1.1040	1.1040	1.1022	1.0998	1.0974
42	1.1068	1.1067	1.1049	1.1025	1.1001
43	1.1095	1.1094	1.1075	1.1052	1.1028
44	1.1122	1.1122	1.1102	1.1079	1.1054
45	1.1149	1.1149	1.1128	1.1106	1.1081
46	1.1176	1.1176	1.1155	1.1133	1.1108
47	1.1203	1.1203	1.1182	1.1160	1.1135
48	1.1230	1.1230	1.1209	1.1187	1.1161
49	1.1257	1.1257	1.1236	1.1213	1.1188
50	1.1285	1.1285	1.1263	1.1239	1.1215
51	1.1313	1.1312	1.1290	1.1265	1.1242
52	1.1341	1.1340	1.1317	1.1292	1.1269
53	1.1369	1.1368	1.1344	1.1319	1.1296
54	1.1397	1.1396	1.1371	1.1346	1.1323
55	1.1425	1.1423	1.1398	1.1374	1.1350
56	1.1453	1.1451	1.1425	1.1401	1.1378
57	1.1481	1.1478	1.1452	1.1429	1.1406
58	1.1509	1.1506	1.1479	1.1457	1.1433
59	1.1537	1.1534	1.1506	1.1484	1.1460
60	1.1564	1.1562	1.1533	1.1511	1.1487
61	1.1591	1.1589	1.1560	1.1538	1.1515
62	1.1619	1.1617	1.1587	1.1565	1.1543
63	1.1647	1.1644	1.1614	1.1592	1.1571
64	1.1675	1.1672	1.1642	1.1620	1.1598
65	1.1703	1.1700	1.1670	1.1647	1.1625
66	1.1731	1.1728	1.1697	1.1674	1.1652
67	1.1759	1.1755	1.1724	1.1702	1.1680
68	1.1787	1.1783	1.1752	1.1729	1.1707
69	1.1815	1.1811	1.1780	1.1756	1.1734
70	1.1842	1.1838	1.1808	1.1784	1.1761
71	1.1870	1.1866	1.1836	1.1811	1.1788
72	1.1897	1.1893	1.1863	1.1838	1.1814
73	1.1924	1.1920	1.1890	1.1865	1.1840
74	1.1951	1.1948	1.1917	1.1892	1.1867
75	1.1979	1.1975	1.1944	1.1919	1.1894
76	1.2006	1.2003	1.1971	1.1946	1.1921
77	1.2033	1.2030	1.1998	1.1973	1.1948
78	1.2060	1.2057	1.2025	1.2000	1.1974
79	1.2087	1.2084	1.2052	1.2027	1.2000
80	1.2114	1.2111	1.2079	1.2054	1.2025
81	1.2141	1.2138	1.2106	1.2081	
82	1.2168	1.2165	1.2133	1.2108	
83	1.2195	1.2191	1.2160	1.2134	
84	1.2222	1.2218	1.2187	1.2161	
85	1.2249	1.2245	1.2214	1.2187	
86	1.2276	1.2271	1.2241	1.2214	
87	1.2303	1.2298	1.2268	1.2241	
88	1.2330	1.2325	1.2294	1.2268	
89	1.2356	1.2351	1.2320	1.2294	

$\frac{^\circ\text{C}}{\%}$	15	15.5	20	25	30
90	1.2382	1.2378	1.2347	1.2320	
91	1.2408	1.2404	1.2374	1.2346	
92	1.2434	1.2430	1.2401	1.2372	
93	1.2460	1.2457	1.2428	1.2398	
94	1.2486	1.2483	1.2455	1.2424	
95	1.2512	1.2509	1.2482	1.2451	
96	1.2538	1.2535	1.2508	1.2477	
97	1.2564	1.2561	1.2534	1.2503	
98	1.2590	1.2587	1.2559	1.2529	
99	1.2616	1.2612	1.2584	1.2555	
100	1.2641	1.2638	1.2609	1.2580	

CH₂O₂, FORMIC ACID*v. also* (26, 37, 57, 66)

$\frac{^\circ\text{C}}{\%}$	0 (10, 82)	15 (80, 81, 82)	20 (68)	30 (82)
0	0.9999	0.9991	0.9982	0.9957
1	1.0028	1.0019	1.0019	(0.9980)
2	1.0059	1.0045	1.0044	(1.0004)
3	1.0090	1.0072	1.0070	(1.0028)
4	1.0120	1.0100	1.0093	(1.0053)
5	1.0150	1.0124	1.0115	1.0075
6	1.0179	1.0151	1.0141	1.0101
7	1.0207	1.0177	1.0170	1.0125
8	1.0237	1.0204	1.0196	1.0149
9	1.0266	1.0230	1.0221	1.0173
10	1.0295	1.0256	1.0246	1.0197
11	1.0324	1.0281	1.0271	1.0221
12	1.0351	1.0306	1.0296	1.0244
13	1.0379	1.0330	1.0321	1.0267
14	1.0407	1.0355	1.0345	1.0290
15	1.0435	1.0380	1.0370	1.0313
16	1.0463	1.0405	1.0393	1.0336
17	1.0491	1.0430	1.0417	1.0358
18	1.0518	1.0455	1.0441	1.0381
19	1.0545	1.0480	1.0464	1.0404
20	1.0571	1.0505	1.0488	1.0427
21	1.0598	1.0532	1.0512	1.0451
22	1.0625	1.0556	1.0537	1.0473
23	1.0652	1.0580	1.0561	1.0496
24	1.0679	1.0604	1.0585	1.0518
25	1.0706	1.0627	1.0609	1.0540
26	1.0733	1.0652	1.0633	1.0564
27	1.0760	1.0678	1.0656	1.0587
28	1.0787	1.0702	1.0681	1.0609
29	1.0813	1.0726	1.0705	1.0632
30	1.0839	1.0750	1.0729	1.0654
31	1.0866	1.0774	1.0753	1.0676
32	1.0891	1.0798	1.0777	1.0699
33	1.0916	1.0821	1.0800	1.0721
34	1.0941	1.0844	1.0823	1.0743
35	1.0966	1.0867	1.0847	1.0766
36	1.0993	1.0892	1.0871	1.0788

CH₂O₂, FORMIC ACID.—(Continued)

$\frac{\text{°C}}{\text{\%}}$	0	15	20	30
37	1.1018	1.0916	1.0895	1.0810
38	1.1043	1.0940	1.0919	1.0832
39	1.1069	1.0964	1.0940	1.0854
40	1.1095	1.0988	1.0963	1.0876
41	1.1122	1.1012	1.0990	1.0898
42	1.1148	1.1036	1.1015	1.0920
43	1.1174	1.1060	1.1038	1.0943
44	1.1199	1.1084	1.1062	1.0965
45	1.1224	1.1109	1.1085	1.0987
46	1.1249	1.1133	1.1108	1.1009
47	1.1274	1.1156	1.1130	1.1031
48	1.1299	1.1179	1.1157	1.1053
49	1.1324	1.1202	1.1185	1.1076
50	1.1349	1.1225	1.1207	1.1098
51	1.1374	1.1248	1.1223	1.1120
52	1.1399	1.1271	1.1244	1.1142
53	1.1424	1.1294	1.1269	1.1164
54	1.1448	1.1318	1.1295	1.1186
55	1.1472	1.1341	1.1320	1.1208
56	1.1497	1.1365	1.1342	1.1230
57	1.1523	1.1388	1.1361	1.1253
58	1.1548	1.1411	1.1381	1.1274
59	1.1573	1.1434	1.1401	1.1295
60	1.1597	1.1458	1.1424	1.1317
61	1.1621	1.1481	1.1448	1.1338
62	1.1645	1.1504	1.1473	1.1360
63	1.1669	1.1526	1.1493	1.1382
64	1.1694	1.1549	1.1517	1.1403
65	1.1718	1.1572	1.1543	1.1425
66	1.1742	1.1595	1.1565	1.1446
67	1.1766	1.1618	1.1584	1.1467
68	1.1790	1.1640	1.1604	1.1489
69	1.1813	1.1663	1.1628	1.1510
70	1.1835	1.1685	1.1655	1.1531
71	1.1858	1.1707	1.1677	1.1552
72	1.1882	1.1729	1.1702	1.1573
73	1.1906	1.1751	1.1728	1.1595
74	1.1929	1.1773	1.1752	1.1615
75	1.1953	1.1794	1.1769	1.1636
76	1.1976	1.1816	1.1785	1.1656
77	1.1999	1.1837	1.1801	1.1676
78	1.2021	1.1859	1.1818	1.1697
79	1.2043	1.1881	1.1837	1.1717
80	1.2065	1.1902	1.1860	1.1737
81	1.2088	1.1924	1.1876	1.1758
82	1.2110	1.1944	1.1896	1.1778
83	1.2132	1.1965	1.1914	1.1798
84	1.2154	1.1985	1.1929	1.1817
85	1.2176	1.2005	1.1953	1.1837
86	1.2196	1.2025	1.1976	1.1856
87	1.2217	1.2045	1.1994	1.1875
88	1.2237	1.2064	1.2012	1.1893
89	1.2258	1.2084	1.2028	1.1910

$\frac{\text{°C}}{\text{\%}}$	0	15	20	30
90	1.2278	1.2102	1.2044	1.1927
91	1.2297	1.2121	1.2059	1.1945
92	1.2316	1.2139	1.2078	1.1961
93	1.2335	1.2157	1.2099	1.1978
94	1.2354	1.2174	1.2117	1.1994
95	1.2372	1.2191	1.2140	1.2008
96	1.2390	1.2208	1.2158	1.2022
97	1.2408	1.2224	1.2170	1.2036
98	1.2425	1.2240	1.2183	1.2048
99	1.2441	1.2257	1.2202	1.2061
100	1.2456	1.2273	1.2212	1.2073

C₂H₄O₂, ACETIC ACID

$\frac{\text{°C}}{\text{\%}}$	0	10	15	20	25	30	40
	(10, 49, 58, 59, 82, 88)	(58, 59)	(41, 58, 59, 61, 62, 80, 81, 82)	(2, 4, 19, 33, 43, 46, 55, 57, 58, 59, 61, 62, 66, 69, 70, 72, 80, 81, 84, 85)	(19, 25, 49, 51, 58, 59, 82)	(19, 58, 59, 82)	(58, 59)
0	0.9999	0.9997	0.9991	0.9982	0.9971	0.9957	0.9922
1	1.0016	1.0013	1.0006	.9996	.9987	.9971	.9934
2	.0033	.0029	.0021	1.0012	1.0000	.9984	.9946
3	.0051	.0044	.0036	.0025	.0013	.9997	.9958
4	.0070	.0060	.0051	.0040	.0027	1.0011	.9970
5	.0088	.0076	.0066	.0055	.0041	.0024	.9982
6	.0106	.0092	.0081	.0069	.0055	.0037	.9994
7	.0124	.0108	.0096	.0083	.0068	.0050	1.0006
8	.0142	.0124	.0111	.0097	.0081	.0063	.0018
9	.0159	.0140	.0126	.0111	.0094	.0076	.0030
10	.0177	.0156	.0141	.0125	.0107	.0089	.0042
11	.0194	.0171	.0155	.0139	.0120	.0102	.0054
12	.0211	.0187	.0170	.0154	.0133	.0115	.0065
13	.0228	.0202	.0184	.0168	.0146	.0127	.0077
14	.0245	.0217	.0199	.0182	.0159	.0139	.0088
15	.0262	.0232	.0213	.0195	.0172	.0151	.0099
16	.0278	.0247	.0227	.0209	.0185	.0163	.0110
17	.0295	.0262	.0241	.0223	.0198	.0175	.0121
18	.0311	.0276	.0255	.0236	.0210	.0187	.0132
19	.0327	.0291	.0269	.0250	.0223	.0198	.0142
20	.0343	.0305	.0283	.0263	.0235	.0210	.0153
21	.0358	.0319	.0297	.0276	.0248	.0222	.0164
22	.0374	.0333	.0310	.0288	.0260	.0233	.0174
23	.0389	.0347	.0323	.0301	.0272	.0244	.0185
24	.0404	.0361	.0336	.0313	.0283	.0256	.0195
25	.0419	.0375	.0349	.0326	.0295	.0267	.0205
26	.0434	.0388	.0362	.0338	.0307	.0278	.0215
27	.0449	.0401	.0374	.0349	.0318	.0289	.0225

C₂H₄O₂, ACETIC ACID.—(Continued)

°C	0	10	15	20	25	30	40
28	1.0463	1.0414	1.0386	1.0361	1.0329	1.0299	1.0234
29	.0477	.0427	.0399	.0372	.0340	.0310	.0244
30	.0491	.0440	.0411	.0384	.0350	.0320	.0253
31	.0505	.0453	.0423	.0395	.0361	.0330	.0262
32	.0519	.0465	.0435	.0406	.0372	.0341	.0272
33	.0532	.0477	.0446	.0417	.0382	.0351	.0281
34	.0545	.0489	.0458	.0428	.0392	.0361	.0289
35	.0558	.0501	.0469	.0438	.0402	.0371	.0298
36	.0571	.0513	.0480	.0449	.0412	.0380	.0306
37	.0584	.0524	.0491	.0459	.0422	.0390	.0314
38	.0596	.0535	.0501	.0469	.0432	.0399	.0322
39	.0608	.0546	.0512	.0479	.0441	.0408	.0330
40	.0621	.0557	.0522	.0488	.0450	.0416	.0338
41	.0633	.0568	.0532	.0498	.0460	.0425	.0346
42	.0644	.0578	.0542	.0507	.0469	.0433	.0353
43	.0656	.0588	.0551	.0516	.0477	.0441	.0361
44	.0667	.0598	.0561	.0525	.0486	.0449	.0368
45	.0679	.0608	.0570	.0534	.0495	.0456	.0375
46	.0689	.0618	.0579	.0542	.0503	.0464	.0382
47	.0699	.0627	.0588	.0551	.0511	.0471	.0389
48	.0709	.0636	.0597	.0559	.0518	.0479	.0395
49	.0720	.0645	.0605	.0567	.0526	.0486	.0402
50	.0729	.0654	.0613	.0575	.0534	.0492	.0408
51	.0738	.0663	.0622	.0582	.0542	.0499	.0414
52	.0748	.0671	.0629	.0590	.0549	.0506	.0421
53	.0757	.0679	.0637	.0597	.0555	.0512	.0427
54	.0765	.0687	.0644	.0604	.0562	.0518	.0432
55	.0774	.0694	.0651	.0611	.0568	.0525	.0438
56	.0782	.0701	.0658	.0618	.0574	.0531	.0443
57	.0790	.0708	.0665	.0624	.0580	.0536	.0448
58	.0798	.0715	.0672	.0631	.0586	.0542	.0453
59	.0805	.0722	.0678	.0637	.0592	.0547	.0458
60	.0813	.0728	.0684	.0642	.0597	.0552	.0462
61	.0820	.0734	.0690	.0648	.0602	.0557	.0466
62	.0826	.0740	.0696	.0653	.0607	.0562	.0470
63	.0833	.0746	.0701	.0658	.0612	.0566	.0473
64	.0838	.0752	.0706	.0662	.0616	.0571	.0477
65	.0844	.0757	.0711	.0666	.0621	.0575	.0480
66	.0850	.0762	.0716	.0671	.0624	.0578	.0483
67	.0856	.0767	.0720	.0675	.0628	.0582	.0486
68	.0860	.0771	.0725	.0678	.0631	.0585	.0489
69	.0865	.0775	.0729	.0682	.0634	.0588	.0491
70	.0869	.0779	.0732	.0685	.0637	.0590	.0493
71	.0874	.0783	.0736	.0687	.0640	.0592	.0495
72	.0877	.0786	.0738	.0690	.0642	.0594	.0496
73	.0881	.0789	.0741	.0693	.0644	.0595	.0497
74	.0884	.0792	.0743	.0694	.0645	.0596	.0498
75	.0887	.0794	.0745	.0696	.0647	.0597	.0499
76	.0889	.0796	.0746	.0698	.0648	.0598	.0499
77	.0891	.0797	.0747	.0699	.0648	.0598	.0499
78	.0893	.0798	.0747	.0700	.0648	.0598	.0498
79	.0894	.0798	.0747	.0700	.0648	.0597	.0497

°C	0	10	15	20	25	30	40
80	1.0895	1.0798	1.0747	1.0700	1.0647	1.0596	1.0495
81	.0895	.0797	.0745	.0699	.0646	.0594	.0493
82	.0895	.0796	.0743	.0698	.0644	.0592	.0490
83	.0895	.0795	.0741	.0696	.0642	.0589	.0487
84	.0893	.0793	.0738	.0693	.0638	.0585	.0483
85	.0891	.0790	.0735	.0689	.0635	.0582	.0479
86	.0887	.0787	.0731	.0685	.0630	.0576	.0473
87	.0883	.0783	.0726	.0680	.0626	.0571	.0467
88	.0877	.0778	.0721	.0675	.0620	.0564	.0460
89	.0872	.0773	.0715	.0668	.0613	.0557	.0453
90	.0865	.0766	.0708	.0661	.0605	.0549	.0445
91	.0857	.0758	.0700	.0652	.0597	.0541	.0436
92	.0848	.0749	.0690	.0643	.0587	.0530	.0426
93	.0838	.0739	.0680	.0632	.0577	.0518	.0414
94	.0826	.0727	.0667	.0619	.0564	.0506	.0401
95	.0813	.0714	.0652	.0605	.0551	.0491	.0386
96	.0798		.0632	.0588	.0535	.0473	.0368
97	.0780		.0611	.0570	.0516	.0454	.0348
98	.0759		.0590	.0549	.0495	.0431	.0325
99	.0730		.0567	.0524	.0468	.0407	.0299
100	.0697		.0545	.0498	.0440	.0380	.0271

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B. SOLUTIONS CONTAINING MORE THAN ONE SOLUTE. BOTH SOLUTES ARE C-COMPOUNDS†

The C-arrangement (p. viii)

Unless otherwise indicated all compositions are given in Wt. % in the solution. All density values are d_4^t = g/ml in vacuo.

B = CCl_4 , Carbon tetrachloride

C = CH_4O , Methyl alcohol (4)

C = $\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol

$t = 19.4^\circ\text{C}$; $R = \%B/\%C$ (6); cf. (4)

$\% \text{H}_2\text{O}$	R	0.05086	0.1096	0.2555	0.4319	0.6313	0.9600
5		0.8251	0.8456	0.8935	0.9423	1.0087	1.0592
10		0.8380	0.8581	0.9031	0.9501	1.0124	1.0601
15		0.8501	0.8693	0.9109	0.9565	1.0150	
20		0.8616	0.8801	0.9185	0.9624		
25		0.8730	0.8903	0.9288			
30		0.8840	0.9000				
35		0.8948	0.9098				
40		0.9052					
100		0.9984					

C = $\text{C}_3\text{H}_8\text{O}$, *n*-Propyl alcohol (4)

B = CHCl_3 , Chloroform

C = CH_4O , Methyl alcohol (4)

C = $\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol (4)

C = $\text{C}_3\text{H}_8\text{O}$, Acetone (4)

C = $\text{C}_3\text{H}_8\text{O}$, *n*-Propyl alcohol (4)

B = CH_2O_2 , Formic acid

C = $\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol (15)

C = $\text{C}_6\text{H}_7\text{N}$, Aniline, 30°C (24)

$\% \text{B}^*$	44.31	31.33	20.31	$\% \text{B}^*$	44.31	31.33	20.31
0	1.0967	1.0678	1.0432	55	1.0836	1.0664	1.0472
5	1.0993	1.0722	1.0487	60	1.0763	1.0599	1.0437
10	1.1017	1.0763	1.0544	65	1.0687	1.0535	1.0399
15	1.1039	1.0797	1.0592	70	1.0609	1.0476	1.0359
20	1.1057	1.0824	1.0625	75	1.0529	1.0420	1.0320
25	1.1069	1.0841	1.0637	80	1.0448	1.0363	1.0282
30	1.1068	1.0847	1.0631	85	1.0365	1.0303	1.0244
35	1.1053	1.0838	1.0613	90	1.0279	1.0242	1.0205
40	1.1018	1.0813	1.0583	95	1.0200	1.0181	1.0166
45	1.0968	1.0773	1.0546	100	1.0131		
50	1.0906	1.0723	1.0508				

$\% \text{B}^* =$	$\% \text{C}^\dagger$	0	5	10	15	96.1
9.64	d_4^{30}	1.0186	1.0254	1.0316	1.0359	1.0146

* Wt. % in solvent, H_2O . † Wt. % in the solution.

B = $\text{CH}_4\text{N}_2\text{O}$, Urea

C = $\text{C}_2\text{H}_4\text{O}_2$, Acetic acid (27)

$\% \text{C}$	29.6	15.1	7.6	3.8	1.9
$\% \text{B}$	0.7	0.7	0.7	0.8	0.8
d_4^{25}	1.0377	1.0191	1.0085	1.0045	1.0022

B = CH_4O , Methyl alcohol

C = $\text{C}_2\text{H}_5\text{Br}$, Ethyl bromide (4)

C = $\text{C}_6\text{H}_5\text{Br}$, Bromobenzene (4)

† Where both solutes are sugars, see Vol. II, p. 352.

C = C_6H_6 , Benzene (1.5)

Aqueous layer			Benzene layer		
$\% \text{B}$	$\% \text{C}$	d_4^{25}	$\% \text{B}$	$\% \text{C}$	d_4^{25}
61.5	11.4	0.8675	30.8	65.0	0.8615
61.0	10.2	0.8700	4.2	95.5	0.8698
60.8	9.8	0.8718	4.1	95.6	0.8700
30.8	65.0	0.8615	4.0	95.7	0.8700

C = C_6H_{14} , Hexane (4)

C = C_7H_{16} , Heptane (4)

C = $\text{C}_{10}\text{H}_{16}\text{O}$, Camphor (22)

$\% \text{B}$	99.0	89.1	79.2	69.3	59.4	49.5
$\% \text{C}$	0.0	10.0	20.0	30.0	40.0	50.0
d_4^{20}	0.812	0.828	0.842	0.858	0.873	0.888

B = $\text{C}_2\text{H}_2\text{Cl}_2\text{O}_2$, Dichloroacetic acid

C = $\text{C}_2\text{H}_4\text{O}_2$, Acetic acid (19)

B = $\text{C}_2\text{H}_4\text{Cl}_2$, 1, 1-Dichloroethane

C = $\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol (4)

B = $\text{C}_2\text{H}_4\text{Cl}_2$, Ethylene chloride

C = $\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol (4)

B = $\text{C}_2\text{H}_4\text{O}_2$, Acetic acid

C = $\text{C}_4\text{H}_7\text{NO}_4$, Aspartic acid (3)

$\% \text{B}$	1.13	2.23	3.31	4.37	5.40	7.40	10.25
$\% \text{C}$	2.50	2.48	2.45	2.42	2.40	2.34	2.27
$10^4(d_4^{20} - 1)$	104	119	133	147	162	185	223

C = $\text{C}_4\text{H}_8\text{N}_2\text{O}_3$, Asparagine (3)

$\% \text{B}$	1.08	2.12	5.15	7.06	9.80	14.01	17.85
$\% \text{C}$	2.36	2.34	2.27	2.22	2.15	2.05	1.96
$10^4(d_4^{20} - 1)$	97	111	151	177	211	264	311

C = C_6H_6 , Benzene (12)

$\% \text{B}$	$\% \text{C}$	$d_4^{24.65}$	$\% \text{B}$	$\% \text{C}$	$d_4^{24.65}$
51.98	40.31	0.9673	50.97	42.01	0.9633
52.48	39.88	0.9681	48.89	45.00	0.9570
54.53	38.15	0.9710	43.03	52.97	0.9412
60.14	33.43	0.9796	32.64	67.30	0.9137
70.51	24.69	0.9955	52.97	39.01	0.9697
99.85	0.0	1.0454	56.43	34.65	0.9788
52.70	40.67	0.9653	64.75	22.99	1.0050
53.97	41.02	0.9632	66.29	12.81	1.0312
55.66	41.81	0.9587	70.08	4.59	1.0520
57.49	42.40	0.9532	55.86	2.60	1.0521

C = $\text{C}_6\text{H}_6\text{O}_2$, Hydroquinol (27)

% C = 0.7	% B.....	29.6	15.0	7.6	3.8
	d_4^{25}	1.0364	1.0200	1.0094	1.0041

C = $\text{C}_6\text{H}_7\text{N}$, Aniline, 30.4°C (24)

$\% \text{B}^*$	100	93.82	90.36	86.46	75.70	58.46	36.56
$\% \text{C}^\dagger$	0	1.0373	1.0456	1.0500	1.0556	1.0565	1.0534
5	.0514	.0578	.0609	.0655	.0650	.0592	.0427
10	.0640	.0682	.0707	.0737	.0716	.0645	.0478
15	.0732	.0754	.0770	.0792	.0756	.0683	.0515
20	.0792	.0797	.0805	.0821	.0776	.0700	.0528
25	.0826	.0816	.0819	.0828	.0777	.0696	.0522
30	.0834	.0814	.0812	.0817	.0763	.0677	.0502
35	.0818	.0796	.0790	.0791	.0735	.0650	.0477
40	.0788	.0763	.0756	.0753	.0699	.0616	.0451
45	.0746	.0720	.0712	.0714	.0656	.0574	.0424
50	.0696	.0670	.0661	.0672	.0608	.0534	.0394

B = $C_2H_4O_2$, Acetic acid.—(Continued)
 C = C_6H_7N Aniline, 30.4°C (24).—(Continued)

% C†	% B*	100	93.82	90.36	86.46	75.70	58.46	36.56
55	1.0640	1.0615	1.0606	1.0618	1.0557	1.0494		
60	.0578	.0554	.0548	.0554	.0504	.0453		
65	.0514	.0493	.0486	.0487	.0450	.0408		
70	.0449	.0434	.0425	.0425	.0395	.0360		
75	.0382	.0376	.0365	.0365	.0341	.0310		
80	.0325	.0319	.0309	.0305	.0288	.0264		
85	.0274	.0259	.0262		.0238	.0222		
90	.0217				.0196	.0186		
95	.0168					.0154		
100	.0128							

* Wt. % in solvent, H_2O .

† Wt. % in solution.

C = $C_7H_7NO_2$, *m*-Aminobenzoic acid (1)

% B.....	0.00	0.06	0.60	6.01	14.02	26.84	46.86
% C.....	0.76	0.79	0.84	1.29	2.66	5.03	7.45
$10^4(d_4^{25} - 1)$	8	72	82	150	300	507	806

C = $C_9H_{13}NO_3S$, Trimethylsulfanilic acid (20)

C = $C_{10}H_{14}N_2$, Nicotine (13)

% B	% C	d_4^{20}	% B	% C	d_4^{20}
22.37	60.44	1.0923	20.64	55.75	1.0996
21.95	59.31	1.0965	20.61	55.69	1.0999
21.30	57.57	1.0976	20.59	55.64	1.1035
21.03	56.81	1.0993	20.56	55.54	1.1295
20.92	56.53	1.0994			

B = C_2H_5Br , Ethyl bromide

C = C_2H_6O , Ethyl alcohol (4)

C = C_3H_8O , *n*-Propyl alcohol (4)

B = C_2H_6O , Ethyl alcohol

C = C_3H_7Br , Propyl bromide (4)

C = $C_3H_7NO_2$, Alanine (17)

Vol. % B*	Wt. % C†	d_4^{25}	Vol. % B*	Wt. % C†	d_4^{25}	Vol. % B*	Wt. % C†	d_4^{25}
0	14.2	1.042	25	6.6	0.989	50	2.3	0.936
5	12.6	1.031	31	5.2	0.976	55	1.8	0.919
10	11.1	1.021	35	4.7	0.967	60	1.6	0.910
15	9.5	1.010	40	3.7	0.958	70	0.84	0.884
20	7.8	0.998	45	3.0	0.945	80	0.37	0.856

* Vol. % in solvent (H_2O) at 15.5°C.

† Wt. % in the solution.

C = $C_3H_8O_3$, Glycerol (11)

% B.....	12.8	13.4	25.1	39.2	37.9	41.0
% C.....	5.7	9.4	38.2	3.8	40.7	6.2
d_4^{15}	0.9928	1.0013	1.0442	0.9464	1.0140	0.9469

C = $C_4H_6O_6$, Tartaric acid (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	42.2	40.0	1.088
0.0	57.9	1.317	66.0	27.8	0.960
3.8	56.1	1.300	73.1	24.2	0.926
15.5	51.4	1.242	78.3	21.7	0.903
27.1	46.8	1.177	100.0	0.0	0.785

C = $C_4H_8O_2$, Ethyl acetate (31); cf. (4)

% C	% B	d_4^{20}	% C	% B	d_4^{20}	% C	% B	d_4^{20}
0	100	0.789	20	40	0.911	50	20	0.920
10	90	0.799	20	30	0.933	60	40	0.852
10	80	0.828	20	20	0.954	60	30	0.880
10	70	0.854	30	70	0.819	60	20	0.907
10	60	0.878	30	60	0.848	70	30	0.863
10	50	0.900	30	50	0.874	70	20	0.892
10	40	0.923	30	40	0.898	80	20	0.874
10	30	0.945	30	30	0.921	80	10	0.904
10	20	0.965	40	60	0.830	90	10	0.887
10	10	0.981	40	50	0.859	100	0	0.900
10	2	0.991	40	40	0.885			
20	80	0.809	40	30	0.909			
20	70	0.838	50	50	0.841			
20	60	0.864	50	40	0.870			
20	50	0.888	50	30	0.896			

% B (29) ||	0.0	7.9	14.7	18.3	17.7	100.0
% C..... ||	7.9	9.6	13.4	31.2	44.6	0.0
d_4^{25}..... ||	0.996	0.987	0.966	0.939	0.924	0.785

C = C_4H_9Br , Isobutyl bromide (4)

C = $C_4H_{10}O$, Isobutyl alcohol (4)

C = $C_4H_{10}O$, Ethyl ether (21, 18); cf. (4, 28)

% C	% B	d_4^{15}	d_4^{25}	% C	% B	d_4^{15}	d_4^{25}
6	0	0.9878		70	25		0.7488
4	0	0.9913	0.9890	60	25		0.7817
2	0	0.9949	0.9928	10	25		0.9347
0	0	0.9991	0.9971	0	25	0.9642	0.9590
6	5	0.9809	0.9772	70	30	0.7476	
4	5	0.9842	0.9808	60	30	0.7812	0.7700
2	5	0.9872	0.9846	50	30	0.8120	0.8016
0	5	0.9903	0.9882	40	30	0.8421	0.8322
90	10	0.7305	0.7174	30	30	0.8720	0.8616
6	10	0.9744	0.9698	20	30	0.9014	0.8936
4	10	0.9774	0.9736	10	30	0.9319	0.9243
2	10	0.9802	0.9773	0	30	0.9569	0.9507
0	10	0.9830	0.9804	50	35		0.7899
80	15		0.7042	40	35		0.8220
6	15	0.9678	0.9627	30	35		0.8528
4	15	0.9712	0.9663	20	35		0.8830
2	15	0.9742	0.9700	10	35		0.9123
0	15	0.9767	0.9733	0	35	0.9483	0.9415
80	20	0.7396	0.7265	60	40	0.7548	
70	20	0.7730	0.7615	50	40	0.7890	0.7759
10	20	0.9513		40	40	0.8187	0.8084
6	20	0.9606	0.9548	30	40	0.8520	0.8394
4	20	0.9644	0.9588	20	40	0.8821	0.8718
2	20	0.9679	0.9628	10	40	0.9097	0.9022
0	20	0.9707	0.9664	0	40	0.9388	0.9315

% C	% B	d_4^{15}	% C	% B	d_4^{15}	% C	% B	d_4^{15}
50	50	0.7620	30	60	0.8031	0	70	0.8719
40	50	0.7962	20	60	0.8344	20	80	0.7835
30	50	0.8266	10	60	0.8652	10	80	0.8156
20	50	0.8568	0	60	0.8952	0	80	0.8477
10	50	0.8882	30	70	0.7766	10	90	0.7892
0	50	0.9178	20	70	0.8099	0	90	0.8223
40	60	0.7694	10	70	0.8406			

Miscible mixtures (8)

% B	% C	d_4^0	% B	% C	d_4^0	% B	% C	d_4^0
24.4	15.6	0.938	27.2	25.0	0.906	21.5	65.0	0.798
22.0	13.0	.948	27.4	30.0	.889	19.2	70.0	.788
18.9	11.1	.958	27.6	35.0	.874	16.5	75.0	.778
14.5	10.5	.967	27.5	40.0	.859	13.4	80.0	.770
9.5	10.5	.974	27.2	45.0	.845	10.2	85.0	.762
3.8	11.2	.978	26.2	50.0	.832	6.8	90.0	.754
23.9	15.0	.940	25.2	55.0	.820	3.4	95.0	.745
26.0	20.0	.922	23.5	60.0	.808			

Coexistent liquid phases at 0°C (8)

Upper layer			Lower layer		
% B	% C	d_4^0	% B	% C	d_4^0
2.7	96.0	0.743	8.4	10.6	0.975
7.5	89.0	0.755	15.5	10.5	0.965
7.7	88.6	0.755	15.5	10.5	0.965
6.7	90.0	0.754	15.5	10.5	0.965
13.4	80.0	0.770	20.1	11.5	0.955
13.8	79.6	0.771	20.0	11.4	0.956
22.0	64.0	0.800	23.4	16.3	0.934
22.0	63.7	0.801	23.5	16.5	0.934
24.8	56.0	0.818	25.2	20.0	0.922
24.3	56.6	0.816	25.0	19.8	0.923

C = $C_5H_{10}O$, Diethylketone (4)C = $C_5H_{10}O_2$, Ethyl propionate (4)C = $C_5H_{11}Br$, Isoamyl bromide (4)C = $C_5H_{12}O$, Amyl alcohol (9)

Upper layer

% B.....	0.0	6.1	14.2	20.6	25.6	28.1	27.7
% C.....	90.7	82.6	70.7	59.4	47.4	32.4	25.6
$d_4^{15.5}$	0.831	0.834	0.840	0.848	0.860	0.888	0.904

Lower layer

% B.....	0.0	5.9	13.0	17.4	21.2	24.8	26.6
% C.....	2.7	2.8	3.0	3.1	4.6	10.8	17.6
$d_4^{15.5}$	0.995	0.986	0.976	0.970	0.961	0.942	0.922

C = $C_5H_{12}O$, Isoamyl alcohol (4)C = $C_6H_3N_3O_6$, 1, 3, 5-Trinitrobenzene (17)

Vol. % B*.....	60	70	75	80	85	90	95	100
% C†.....	0.23	0.38	0.47	0.57	0.78	1.1	1.5	2.3
d_4^{25}	0.906	0.881	0.871	0.858	0.844	0.829	0.813	0.796

* In the aqueous solvent, 15.5°C. † Wt. % in the solution.

C = C_6H_5Br , Bromobenzene (4)C = $C_6H_5NO_2$, Nitrobenzene (4)C = C_6H_7N , Aniline (14)C = $C_6H_8O_7$, Citric acid (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	33.8	51.9	1.156	61.6	38.4	1.007
12.6	60.6	1.264	42.6	47.9	1.112	100.0	0.0	0.785
21.8	57.1	1.212	52.1	43.0	1.054			

C = $C_6H_{12}O_2$, Ethyl butyrate (4)C = C_6H_{14} , Hexane (4)C = C_7H_6O , Benzaldehyde (4)C = $C_7H_6O_2$, Benzoic acid (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	41.9	17.8	0.944	63.1	36.9	0.907
0.0	0.37	0.997	49.1	30.1	0.938	100.0	0.0	0.785
8.7	0.58	0.984	54.1	35.0	0.928			
30.4	4.7	0.955	61.2	36.5	0.910			

C = C_6H_6 , Benzene (1.2); cf. (4)

% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.00	0.00	0.9971	51.49	32.58	0.8519
0.00	100.00	0.8736	60.00	0.00	0.8870
10.00	0.00	0.9804	60.00	3.90	0.8796
10.00	89.93	0.8631	60.00	7.05	0.8739
10.00	90.00	0.8630	60.00	14.06	0.8618
18.48	81.52	0.8550	60.00	19.16	0.8537
20.00	0.00	0.9664	60.00	23.21	0.8470
20.00	77.69	0.8567	60.00	28.60	0.8380
20.00	80.00	0.8535	60.00	34.47	0.8280
30.00	0.00	0.9507	60.00	40.00	0.8182
30.00	63.81	0.8543	70.00	0.00	0.8634
30.00	65.44	0.8516	70.00	7.46	0.8501
30.00	67.28	0.8490	70.00	10.72	0.8442
30.00	67.58	0.8482	70.00	14.68	0.8372
30.00	70.00	0.8447	70.00	18.09	0.8316
32.42	60.85	0.8529	70.00	22.45	0.8239
38.08	52.46	0.8524	70.00	24.31	0.8201
40.00	0.00	0.9315	70.00	25.64	0.8181
40.00	0.40	0.9306	70.00	30.00	0.8095
40.00	48.61	0.8533	73.46	0.00	0.8551
40.00	54.31	0.8449	80.00	0.00	0.8391
40.00	59.72	0.8360	79.98	3.58	0.8327
40.00	60.00	0.8357	79.98	9.23	0.8227
43.43	44.53	0.8520	79.99	13.75	0.8142
49.85	0.00	0.9102	79.99	15.89	0.8102
49.85	1.22	0.9079	79.99	20.01	0.8010
49.86	4.99	0.9007	89.97	0.00	0.8137
50.00	0.00	0.9098	89.94	2.42	0.8092
50.00	5.87	0.8992	89.92	4.99	0.8042
50.00	8.44	0.8946	89.90	7.53	0.7990
50.00	30.80	0.8779	89.87	10.13	0.7934
50.00	35.76	0.8500	100.00	0.00	0.7851
50.00	39.85	0.8435			
50.00	44.18	0.8361			
50.00	50.00	0.8269			

C = $C_7H_6O_3$, Salicylic acid (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	44.4	12.8	0.942	66.8	33.2	0.916
0.0	0.22	0.998	53.4	24.0	0.938	100.0	0.0	0.785
8.7	0.34	0.983	60.7	31.0	0.929			
31.1	2.7	0.954	65.2	32.4	0.920			

C = $C_7H_6O_5 \cdot H_2O$, Gallic acid (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	37.1	11.2	0.971	77.9	22.1	0.899
0.0	1.2	0.999	57.6	18.0	0.943	100.0	0.0	0.785
16.4	3.3	0.982	70.7	21.2	0.916			

C = C_7H_7Br , Bromotoluene (4)C = C_7H_7NO , Benzamide (17)

% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}
0.0	1.3	0.999	40	7.9	0.958	75	20.3	0.917
5	1.6	0.992	45	9.9	0.953	80	20.9	0.907
15	2.2	0.982	50	12.1	0.948	83	21.0	0.900
20	2.7	0.976	55	14.1	0.944	85	20.7	0.895
25	3.5	0.972	60	16.0	0.939	90	19.7	0.878
31	5.1	0.966	65	17.8	0.932	95	17.4	0.856
35	5.9	0.963	70	19.3	0.925	100	14.6	0.830

* Vol. % in the aqueous solvent, 15.5°C. † Wt. % in the solution.

C = $C_7H_7NO_2$, p-Nitrotoluene (4)

B = C_2H_6O , Ethyl alcohol.—(Continued)C = C_7H_8 , Toluene (4)C = $C_7H_8N_2S$, Phenylthiourea (17)

% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}
0	0.24	0.998	50	1.8	0.932	75	4.3	0.881
15	0.38	0.979	55	2.3	0.923	80	4.5	0.868
25	0.56	0.968	60	2.7	0.913	85	4.8	0.854
35	0.83	0.956	65	3.3	0.902	90	4.5	0.839
40	1.1	0.949	70	3.8	0.892	95	4.2	0.820

* Vol. % in the aqueous solvent, 15.5°C.

† Wt. % in the solution.

C = C_7H_8O , Benzyl alcohol (4)C = C_7H_9N , Methylaniline (4)C = C_7H_9N , o-Toluidine (4)C = C_7H_{16} , Heptane (4)C = $C_8H_8O_3$, Methyl salicylate (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	31.4	47.7	0.921	48.1	17.1	0.885
0.0	0.12	0.997	0.61	6.4	0.941	31.6	79.1	0.785
0.0	0.12	0.997	0.61	6.4	0.941	31.6	79.1	0.785

C = C_8H_9NO , Acetanilide (17)

% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}
0	0.54	0.997	45	6.8	0.945	85	26.9	0.900
10	0.93	0.984	50	8.9	0.940	87	27.4	0.896
15	1.0	0.980	55	11.6	0.934	90	27.6	0.890
20	1.3	0.974	60	14.2	0.929	93	27.6	0.881
25	1.7	0.968	65	17.0	0.923	95	26.8	0.874
31	2.5	0.962	70	19.8	0.918	100	24.8	0.851
35	3.5	0.957	75	22.6	0.913			
40	4.8	0.951	80	25.2	0.907			

* Vol. % in the aqueous solvent, 15.5°C.

† Wt. % in the solution.

C = C_8H_{10} , Xylenes (4)C = $C_8H_{10}O$, Phenetole (4)C = $C_9H_{10}O_2$, Benzyl acetate (4)C = $C_9H_{11}NO$, Acettoluide (17)

% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}
0	0.12	0.998	45	1.4	0.938	80	7.8	0.868
5	0.13	0.990	50	1.9	0.931	85	8.8	0.858
15	0.16	0.978	55	2.6	0.921	90	9.6	0.844
20	0.23	0.972	60	3.5	0.912	93	9.8	0.834
25	0.31	0.967	65	4.2	0.902	95	9.7	0.828
35	0.66	0.954	70	5.5	0.890	100	9.2	0.807
40	0.95	0.946	75	6.6	0.880			

* Vol. % in the aqueous solvent, 15.5°C.

† Wt. % in the solution.

C = C_9H_{12} , Mesitylene (4)C = $C_9H_{12}O$, Ethyl benzyl ether (4)C = $C_{10}H_{16}$, Pinene (4)C = $C_{10}H_{16}O$, Camphor (22)

% B	% C	d_4^{20}	% B	% C	d_4^{20}	% B	% C	d_4^{20}
90.0	0	0.833	99.0	0	0.793	59.4	40	0.862
81.0	10	0.846	89.1	10	0.811	49.5	50	0.878
72.0	20	0.859	79.2	20	0.826			
63.0	30	0.871	69.3	30	0.844			

C = $C_{10}H_{16}O_4$, Camphoric acid (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	31.3	38.6	0.997	47.9	50.4	0.967
0.0	0.75	0.997	35.9	48.9	0.997	49.9	50.1	0.957
8.6	1.2	0.997	40.4	51.5	0.982	100.0	0.0	0.785
26.7	16.3	0.997	44.7	51.1	0.977			

C = $C_{10}H_{22}O$, Isoamyl ether (4)C = $C_{12}H_{11}NO$, Acetnaphthalide (17)

% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}
10	0.04	0.984	60	1.4	0.909	90	4.0	0.834
20	0.09	0.972	65	1.8	0.898	93	4.1	0.825
35	0.25	0.954	70	2.3	0.880	95	4.1	0.815
40	0.36	0.946	75	2.7	0.876	100	3.9	0.792
50	0.70	0.929	80	3.1	0.862			
55	1.0	0.920	85	3.6	0.848			

* Vol. % in the aqueous solvent, 15.5°C.

† Wt. % in the solution.

C = $C_{12}H_{22}O_{11}$, Sucrose (11)

% B	% C	$d_4^{17.5}$	% B	% C	$d_4^{17.5}$	% B	% C	$d_4^{17.5}$
0.0	66.0	1.3237	17.0	49.0	1.1831	68.0	7.4	0.8943
3.0	62.7	1.2980	24.8	41.7	1.1289	84.7	1.1	0.8367
6.7	58.8	1.2643	35.4	32.1	1.0568	95.5	0.4	0.8074
11.1	55.1	1.2308	50.4	19.2	0.9744			

C = $C_{13}H_{10}O_3$, Phenyl salicylate (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	50.5	0.86	0.909	65.3	34.7	0.895
0.0	0.02	0.996	67.2	4.4	0.875	100.0	0.0	0.785
8.7	0.02	0.982	77.5	11.9	0.861			
31.9	0.07	0.947	70.7	26.7	0.876			

C = $C_{13}H_{12}N_2O$, Benzoylphenylhydrazine (17)

% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}
40	0.16	0.946	70	1.1	0.884	90	2.2	0.831
50	0.32	0.928	75	1.2	0.872	93	2.9	0.822
55	0.51	0.917	80	1.6	0.859	95	2.4	0.814
65	0.81	0.896	85	1.9	0.846	100	2.3	0.793

* Vol. % in aqueous solvent, 15.5°C.

† Wt. % in the solution.

C = $C_{18}H_{36}O_2$, Stearic acid (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	41.7	0.12	0.926	90.3	6.4	0.801
0.0	0.03	0.996	69.7	0.81	0.862	91.7	8.3	0.793
16.9	0.03	0.969	86.9	3.2	0.815	100.0	0.0	0.785

C = $C_{19}H_{17}N_3$, Triphenylguanidine (17)

% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}	% B*	% C†	d_4^{25}
60	0.22	0.905	80	1.0	0.857	95	3.6	0.816
70	0.48	0.883	85	1.6	0.843	100	5.9	0.802
75	0.67	0.870	90	2.3	0.831			

* Vol. % in aqueous solvent, 15.5°C.

† Wt. % in the solution.

C = $C_{27}H_{30}N_2O_{5.5}H_2O$, Quinine salicylate (29)

% B	% C	d_4^{25}	% B	% C	d_4^{25}	% B	% C	d_4^{25}
0.0	0.0	0.997	50.7	1.8	0.911	92.7	4.1	0.809
0.0	0.06	0.996	69.1	3.4	0.871	96.7	3.2	0.795
32.2	0.57	0.947	88.3	4.6	0.823	100.0	0.0	0.785

B = C_3H_6O , AcetoneC = $C_4H_{10}O$, n-Butyl alcohol (25)

% B	% C	d_4^{20}	% B	% C	d_4^{20}
9.93	0.00	0.9859	40.06	30.26	0.8717
9.44	4.93	0.9790	34.41	40.13	0.8617
8.92	10.13	0.9709	22.92	60.13	0.8431
19.31	0.00	0.9731	71.10	0.00	0.8723
18.33	5.06	0.9667	63.56	10.61	0.8648
17.36	10.10	0.9584	56.80	20.11	0.8600
16.38	15.18	0.9495	49.89	29.89	0.8508
15.40	20.24	0.9398	42.60	40.09	0.8438
29.62	0.00	0.9578	35.50	50.07	0.8376
26.59	10.22	0.9426	79.92	0.00	0.8504
24.01	18.94	0.9277	63.81	20.17	0.8405
21.12	28.70	0.9117	47.51	40.30	0.8313

C = $C_4H_{10}O$, *n*-Butyl alcohol.—(Continued)

% B	% C	d_4^{20}	% B	% C	d_4^{20}
37.49	0.00	0.9451	31.95	60.03	0.8232
33.69	10.14	0.9309	15.97	80.02	0.8158
29.86	20.34	0.9143	89.58	0.00	0.8224
26.11	30.36	0.8993	80.55	10.08	0.8207
22.37	40.33	0.8851	71.75	19.90	0.8190
50.03	0.00	0.9207	62.72	29.98	0.8173
45.01	10.04	0.9076	54.11	39.59	0.8158
39.84	20.37	0.8945	44.81	49.98	0.8145
35.06	29.93	0.8828	35.85	59.98	0.8134
30.02	40.00	0.8710	18.01	79.90	0.8113
28.23	49.57	0.8603	95.10	0.00	0.8071
57.46	0.00	0.9048	30.86	69.14	0.8038
51.53	10.32	0.8935	50.00	50.00	0.8000
45.85	20.20	0.8822	70.47	29.53	0.7966

Saturated solutions

% B	% C	d_4^{20}	% B	% C	d_4^{20}
0.00	7.90	0.9869	13.42	36.91	0.9072
9.26	12.00	0.9670	13.10	47.02	0.8875
11.62	18.64	0.9485	11.65	53.86	0.8765
12.65	24.68	0.934	8.28	63.68	0.8635
12.95	28.15	0.9261	0.00	79.94	0.8479

C = C_6H_5Br , Bromobenzene (4)

C = Cellulose acetate (2)

% C	% B	d_4^{25}	% C	% B	d_4^{25}	% C	% B	d_4^{25}
5.0	95.0	0.807	4.9	92.4	0.814	4.5	86.0	0.834
5.0	94.4	0.808	4.8	91.3	0.818	4.3	81.6	0.850
4.9	94.0	0.810	4.7	90.3	0.823	4.1	77.5	0.862
4.9	92.8	0.811	4.7	88.8	0.826	3.8	72.2	0.878
4.9	92.6	0.815	4.6	87.7	0.846	3.6	67.4	0.890

B = C_3H_8O , *n*-Propyl alcoholC = C_6H_5Br , Bromobenzene (4)C = C_7H_7Br , Bromotoluene (4)B = $C_3H_8O_3$, GlycerolC = $C_3H_8O_2$, Trimethyleneglycol, 20°C (5)

% B	% C	0	2	5	10	15	20	25
100	1.262							
95	1.249							
90	1.235	1.236						
85	1.222	1.223	1.224					
80	1.208	1.210	1.211	1.213	1.214			
75	1.195	1.196	1.198	1.200	1.202	1.203		
70	1.181	1.183	1.185	1.187	1.190	1.192	1.193	
65	1.168	1.169	1.171	1.174	1.177	1.179	1.181	
60	1.154	1.156	1.158	1.161	1.164	1.167	1.168	
55	1.140	1.142	1.144	1.148	1.151	1.154	1.156	
50	1.127	1.128	1.130	1.134	1.138	1.141	1.144	
45	1.113	1.114	1.117	1.121	1.125	1.128	1.131	
40	1.099	1.100	1.103	1.107	1.111	1.116	1.119	
35						1.103	1.106	

100% C, $d_4^{20} = 1.0535$ C = $C_4H_6O_4$, Succinic acid (16)

% B*	% C	d_4^{25}	% B*	% C	d_4^{25}	% B*	% C	d_4^{25}
0.0	0.8	1.0213	31.4	0.6	1.0897	68.9	0.4	1.1804
7.1	0.7	1.0407	40.7	0.6	1.1120	99.6	0.4	1.2530
20.3	0.7	1.0644	48.5	0.5	1.1298			

* Impure.

B = $C_4H_6O_4$, Succinic acidC = $C_4H_{10}O$, Ethyl ether (10)B = $C_4H_8O_2$, Butyric acidC = C_6H_7N , Aniline, 30°C (24)

% B*	100	96.09	83.46	% B*	100	96.09	83.46
0†	0.9496	0.9652	0.9751	40	0.9994	1.0084	1.0109
5	0.9587	0.9752	0.9837	45	1.0013	1.0093	1.0114
10	0.9673	0.9845	0.9916	50	1.0027	1.0097	1.0114
15	0.9753	0.9923	0.9986	55	1.0038	1.0096	1.0112
20‡	0.9818	0.9981	1.0035	60	1.0048	1.0095	1.0108
25	0.9872	1.0024	1.0066	65	1.0060	1.0096	1.0107
30	0.9925	1.0054	1.0088	70	1.0070	1.0099	1.0108
35	0.9966	1.0073	1.0102	75	1.0080	1.0103	1.0109

* In the water-butyric acid solvent.

† $d_4^{30} = 0.9898$ for 64.01% B.‡ $d_4^{30} = 1.0120$ for 64.01% B.

§ In the solution.

B = C_6H_6O , PhenolC = C_7H_7NO , Benzamide (23)B = C_6H_7N , AnilineC = C_6H_5ClN , Aniline hydrochloride (30)The solvent is an aqueous solution containing $\frac{1}{2}$ g-mole aniline per liter

% C	d_4^{25}	% C	d_4^{25}	% C	d_4^{25}	% C	d_4^{25}
1.4	1.0008	6.1	1.0102	14.9	1.0278	33.6	1.0653
2.6	1.0036	8.0	1.0138	18.5	1.0352	41.8	1.0794
3.8	1.0058	10.7	1.0198	25.3	1.0490	49.1	1.0937
4.7	1.0077	14.0	1.0267	32.4	1.0624		

C = C_7H_8 , Toluene (26)

LITERATURE

(For a key to the periodicals see end of volume)

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- (10) Forbes and Coolidge, 1, 41: 150; 19. (11) Fresenius and Grünhut, 91, 51: 23, 104; 12. (12) Friedländer, 7, 38: 385; 01. (13) Gennari, 7, 19: 130; 96. (14) Gladstone and Dale, 62, 153: 317; 63. (15) Hartwig, 8, 33: 58; 88. (16) Herz and Knoch, 93, 45: 262; 05. (17) Holleman and Antusch, 70, 13: 277; 94. (18) Horiba, 41, 31: 922; 10. (19) Kanitz, 7, 22: 336; 97.
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- (30) Sidgwick and Wilsdon, 4, 99: 1118; 11. (31) Steffens and Chenoweth, Brooklyn, N. Y., O.

DENSITY AND THERMAL EXPANSION OF HOMOGENEOUS NON-AQUEOUS MIXTURES IN THE LIQUID OR CRYSTALLINE STATE (NON-AQUEOUS LIQUID OR SOLID SOLUTIONS)

MALCOLM M. HARING

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ALL COMPONENTS CHEMICAL COMPOUNDS	TOUS LES CONSTITUANTS SONT DES COMPOSÉS CHIMIQUES	ALLE KOMPONENTEN SIND CHEMISCHE VERBINDUNGEN	TUTTI I COMPONENTI SONO COMPOSTI	
1. No component has a key formula beginning with 16.	1. Aucun des constituants ne possède une formule clé commençant par 16.	1. Keine Komponente hat eine mit 16 beginnende Schlüsselformel.	1. Nessun componente possiede una formula chiave che comincia con 16.	
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2. One, and only one, component has a key formula not beginning with 16.	2. Un constituant, et un constituant seulement, possède une formule clé ne commençant pas par 16.	2. Eine und nur eine Komponente hat eine nicht mit 16 beginnende Schlüsselformel.	2. Uno solo dei componenti ha una formula chiave che non comincia con 16.	
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3. All components have key formulae beginning with 16.	3. Tous les constituants possèdent une formule clé commençant par 16.	3. Die Schlüsselformeln aller Komponenten beginnen mit 16.	3. La formula chiave di tutti i componenti comincia con 16.	
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INTRODUCTION

Arrangement.—Arrangement is by groups as shown by the table of contents above.

Scope.—For all binary systems the density data are given when the accuracy is 0.1% or better except in the case of fragmentary values and values for saturated solutions (for the latter class of values the reader is referred to Seidell's "Solubilities" (297)). Systems under pressures greater than one atmosphere and ternary systems (except a few of considerable importance) are given by literature reference only. References written ¹ indicate that the reliable data cover less than three values, and ² that data for densities of saturated solutions are included.

Units.—All density values and all compositions in mass units are based upon true mass ("weight in vacuo").

Temperature Functions.—Variation of density with temperature is sometimes given by recording under "a," (resp. "10³b") the two terms

$$a, [\text{resp. } 10^3b(t - t_0)] \text{ of the function:} \\ d_4^t = a - b(t - t_0)$$

Example: In Sec. IV, p. 144, the density of a liquid mixture of CCl₄ and C₆H₄Cl₂, containing 93.62 Wt. % of CCl₄ is given by $d_4^t = [1.5794 - 1.836 \times 10^{-3}(t - 15^\circ)] \pm 0.075\%$, for the range 15 – 65°C; and hence, e.g.,

$$d_4^{35} = 1.5427 \pm 0.0011 \text{ g/ml.}$$

Conversion Factors.—Conversion of Wt. % to Mol % and vice versa is made by means of the relation:

$$\text{Wt. \% A} = \frac{100 \times \text{Mol \% A} \times \text{Molecular Wt. A}}{(\text{Mol \% A} \times \text{Molecular Wt. A}) + (\text{Mol \% B} \times \text{Molecular Wt. B})}$$

INTRODUCTION

Arrangement.—L'arrangement est fait par groupes ainsi qu'il est indiqué dans la table des matières ci-dessus.

Champ.—Pour tous les systèmes binaires, les valeurs des densités sont données lorsque la précision est de 0,1% ou meilleure, excepté dans les cas de valeurs fragmentaires et de valeurs concernant les solutions saturées (pour cette dernière catégorie de

valeurs, le lecteur s'adressera à "Solubilities" de Seidell (297). Les systèmes se trouvant sous des pressions supérieures à une atmosphère et les systèmes ternaires (à l'exception de quelques-uns qui présentent une importance considérable) ne sont donnés que par des références bibliographiques. Les références écrites comme suit ¹ indiquent que la donnée digne de confiance se rapporte à moins de trois valeurs, et ² signifie que les données pour les densités des solutions saturées sont incluses.

Unités.—Toutes les valeurs de densité et toutes les compositions exprimées en unités de masse sont basées sur les masses vraies ("poids dans le vide").

Equations de température.—La variation de la densité avec la température est donnée quelquefois en inscrivant sous "a" (resp. "10³b") les deux termes

$$a, [(resp. 10^3b(t - t_s))] \text{ de la fonction:}$$

$$d_4^t = a - b(t - t_s)$$

Exemple: Dans la Section IV, p. 144, la densité d'un mélange liquide de CCl₄ et de C₆H₄Cl₂, contenant 93,62% poids de CCl₄, sera donnée par la relation

$$d_4^t = [1,5794 - 1,836 \times 10^{-3} (t - 15^\circ)] \pm 0,075\%,$$

pour l'intervalle 15 – 65°C; de là on tire

$$d_4^{25} = 1,5427 \pm 0,0011 \text{ g/ml.}$$

Facteurs de conversion.—La conversion des % poids en % molécules et vice-versa se fait par la relation:

$$\% \text{ Poids de A} = \frac{100 \times \% \text{ Mol. de A} \times \text{Poids Mol. de A}}{(\% \text{ Mol. de A} \times \text{Poids Mol. de A}) + (\% \text{ Mol. de B} \times \text{Poids Mol. de B})}$$

EINLEITUNG

Anordnung.—Diese ist nach Gruppen durchgeführt, wie sie oben in dem Inhaltsverzeichnis angegeben ist.

Umfang.—Bei allen binären Systemen ist die Dichte dann angegeben, wenn die Genauigkeit 0,1% oder grösser ist. Ausnahmen sind in Fällen mit unvollständigen Angaben und bei den gesättigten Lösungen gemacht. Für gesättigte Lösungen siehe Seidell ["Solubilities" (297)]. Systeme unter grösserem Druck als 1 Atmosphäre und ternäre Systeme (ausgenommen einiger weniger von grösserer Bedeutung) sind nur durch Literaturnachweise angegeben. Stellen mit der Bezeichnung ¹ bedeuten, dass die verwendbaren Daten weniger als drei Werten entsprechen und ² bedeutet, dass die Dichte der gesättigten Lösungen mit eingeschlossen sind.

Einheiten.—Dichten und Zusammensetzungen beziehen sich immer auf die wirkliche Masse ("Gewicht im Vakuum").

Temperatur-Gleichungen.—Die Änderung der Dichte mit der Temperatur ist zuweilen durch die Angaben unter "a" (bezw. unter "10³b") gegeben. Es sind dies die zwei Terme

$$a, [\text{bezw. } 10^3b(t - t_s)] \text{ der Gleichung:}$$

$$d_4^t = a - b(t - t_s).$$

Beispiel: In Sec. IV, p. 144, ist die Dichte einer flüssigen Mischung von CCl₄ und C₆H₄Cl₂ mit 93,62 Wt. % (Gewichts %) CCl₄ gegeben, durch die Gleichung

$$d_4^t = [1,5794 - 1,836 \times 10^{-3} (t - 15^\circ)] \pm 0,075\%$$

gültig für den Temperatur-Bereich 15 – 65°C. Es ist daher, z. B.,

$$d_4^{25} = 1,5427 \pm 0,0011 \text{ g/ml.}$$

Umrechnungsfaktoren.—Die Umrechnung von Gewichts-Prozenten (Wt. %) auf Mol % und umgekehrt erfolgt nach der Gleichung:

$$\text{Gewichts \% (Wt. \%) A} = \frac{100 \text{ Mol \% A} \times \text{Molekulargewicht A}}{(\text{Mol \% A} \times \text{Molekulargewicht A}) + (\text{Mol \% B} \times \text{Molekulargewicht B})}$$

INTRODUZIONE

Disposizione della materia.—La divisione è fatta per gruppi come risulta dall'indice.

Contenuto.—Per tutti i sistemi binari la densità è riportata solo quando l'esattezza è del 0,1% o maggiore. Sono eccettuati i casi in cui si hanno dati incompleti, e le soluzioni sature. Per le soluzioni sature vedi Seidell "Solubilities" (297). Per i sistemi a pressioni maggiori di una atmosfera e per i sistemi ternari, (eccettuati pochi di considerevole importanza), sono riportate soltanto le indicazioni bibliografiche. Le citazioni contrassegnate con ¹ indicano che i dati attendibili comprendono meno di tre valori, e quelle contrassegnate con ² indicano che vi sono comprese le densità delle soluzioni sature.

Unità.—Densità e composizione si riferiscono sempre alle masse effettive (peso nel vuoto).

Variazioni in funzione della temperatura.—Sotto "a" (oppure "10³b") sono riportate qualche volta le variazioni di densità con la temperatura, e precisamente sono riprodotti i due termini

$$a, [\text{oppure } 10^3b(t - t_s)] \text{ della equazione:}$$

$$d_4^t = a - b(t - t_s).$$

Esempio: Nella Sezione IV, p. 144, la densità di una miscela liquida di CCl₄ e C₆H₄Cl₂ contenente 93,62% (peso %) di CCl₄ è data dall'equazione:

$$d_4^t = 1,5794 - 1,836 \times 10^{-3} (t - 15^\circ) \pm 0,075\%,$$

che è valida per le temperature tra 15 e 65°C. Si avrà perciò per esempio:

$$d_4^{25} = 1,5427 \pm 0,0011 \text{ g/ml.}$$

Fattori di conversione.—La trasformazione delle percentuali in peso in percentuale in molecole e viceversa, si effettua mediante l'equazione:

$$\text{Peso \% A} = \frac{100 \times \text{Mol. \% di A} \times \text{Peso molecolare di A}}{(\text{Mol. \% di A} \times \text{Peso molec. di A}) + (\text{Mol. \% di B} \times \text{Peso mol. di B})}$$

SEC. I. AT LEAST ONE COMPONENT IS AN ELEMENTARY SUBSTANCE

Arrangement.—The elementary substance is in all cases the A-component and the systems are arranged in order of their A-components, in accordance with the Standard arrangement.

If both components are elementary substances the one with the lower key number is the A-component. Under a given A-component the B-components are arranged in accordance with the Standard (resp. C) arrangement, etc.

1. Two-Component Systems

Cl ₂ B = Br ₂		B = ICl ₃ (to 29.2 Wt. % B)(244)	
Wt. % B	d ₄ ²⁵ (±0.1%) (3)	Wt. % B	d ₄ ²⁵ (3.077 - 0.0049 × Wt. % B) ± 0.25%
95.577	2.955		
92.271	2.853		
B = CCl ₄ (170.1) B = CHCl ₃ (164)		B = CCl ₄ (±0.0075%) (143)	
Wt. % A	d ₄ ²⁵	Wt. % A	d ₄ ²⁵
		0.165	1.7657
		0.087	1.7004
		0.082	1.6964
		0.073	1.6888
		0.061	1.6801
		0.054	1.6747
		0.018	1.6463
		0.016	1.6447

$$\text{Br}_2$$

$$B = I_2$$

$$\text{(to 44.4 Wt. \% B)(243)}$$

$$d_4^{25} = (3.077 + 0.01161 \times \text{Wt. \% B}) \pm 0.25\%$$

Br₂—(Continued)
B = CCl₄—(Continued)
 (to 3.583 Wt. % A)(147)
 $d_4^{32.5} = (1.5676 + 0.027535 \times$
 Wt. % A) $\pm 0.01\%$
 a | 10³b
 (40° – 75°)
 ($\pm 0.075\%$)(172)
 0.00 Wt. % A
 1.5555 | 1.895(t – 40)
 10.90 Wt. % A
 1.6379 | 1.978(t – 40)

B = C₃H₁₀ClN
 Trimethylammonium chloride
 Wt. % A | d_4^{18}
 ($\pm 0.25\%$)(52)
 100.00 | 3.131
 98.16 | 3.070
 97.12 | 3.057
 93.81 | 2.953

B = C₆H₅NO₂
 Nitrobenzene
 (to 6.183 Wt. % A)(147)
 $d_4^{32.5} = (1.1907 + 0.02728 \times$
 Wt. % A) $\pm 0.01\%$

I₂
B = Se (16)
B = Te (16)
B = CCl₄
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 1.59603
 0.722 | 1.60276
 0.728 | 1.60295
 0.820 | 1.60371
 0.824 | 1.60376

B = CS₂
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 1.26619
 1.674 | 1.28112
 3.200 | 1.29496
 6.300 | 1.32426

B = CH₂I₂
 Methylene iodide (260)

B = CH₄O
 Methyl alcohol (357)¹
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 0.79827
 3.859 | 0.82401
 3.871 | 0.82404
 7.310 | 0.84815

B = C₂H₄Br₂
 Ethylene bromide
 (to 2.607 Wt. % A)(54)
 $d_4^{18} = (2.18379 + 0.01018 \times$
 Wt. % A) $\pm 0.0075\%$

B = C₂H₅I
 Ethyl iodide
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 1.93936
 0.809 | 1.94843
 1.611 | 1.95762

B = C₂H₆O
 Ethyl alcohol (303)
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 0.79152
 2.670 | 0.80909
 5.218 | 0.82656
 10.145 | 0.86278

B = C₃H₆O₂
 Methyl acetate
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 0.93583
 1.701 | 0.94728
 3.319 | 0.95921
 3.329 | 0.96064

B = C₃H₈O₃
 Glycerol (116)^{1,2}

B = C₄H₈O₂
 Ethyl acetate
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 0.90166
 2.785 | 0.92142
 3.452 | 0.94128

B = C₄H₁₀O
 Ethyl ether
 ($\pm 0.0075\%$)(54)
 0.000 | 0.71596
 3.311 | 0.73689
 6.420 | 0.75761

B = C₅H₅N
 Pyridine
 ($\pm 0.0075\%$)(54)
 0.000 | 0.97104
 3.141 | 0.99546
 6.036 | 1.01896

B = C₆H₅Cl
 Chlorobenzene
 ($\pm 0.0075\%$)(54)
 0.000 | 1.10786
 1.122 | 1.11690
 2.239 | 1.12599
 4.326 | 1.14340

B = C₆H₅NO₂
 Nitrobenzene
 ($\pm 0.0075\%$)(54)
 0.000 | 1.20544
 1.010 | 1.21380
 2.008 | 1.22220
 3.973 | 1.23890

B = C₆H₆
 (8.35 Wt. % A)(25° – 75°)
 ($\pm 0.075\%$)(112)
 a | 10³b
 0.9320 | 1.108(t – 25)

B = C₇H₈
 Toluene
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 0.86767
 2.708 | 0.88660
 5.280 | 0.90536
 ($\pm 0.075\%$)(112) (25° – 75°)
 a | 10³b
 0.00 Wt. % A
 0.8599 | 0.890(t – 25)
 1.16 Wt. % A
 0.8690 | 0.932(t – 25)
 3.92 Wt. % A
 0.8877 | 0.934(t – 25)

B = C₇H₁₆
 Heptane
 Wt. % A | d_4^{18}
 ($\pm 0.0075\%$)(54)
 0.000 | 0.73281
 1.251 | 0.74038
 1.259 | 0.74040

B = C₈H₇N
 Phenylacetonitrile
 ($\pm 0.0075\%$)(54)
 0.000 | 1.01812
 1.066 | 1.02617
 2.127 | 1.03435

S (Engel)
B = CS₂
 (to 7.92 Wt. % A)(7)
 $d_4^{25} = (1.256 + 0.002526 \times$
 Wt. % A) $\pm 0.25\%$

S_A
B = CS₂
 (to 13.12 Wt. % A)(7)
 $d_4^{25} = (1.256 + 0.00493 \times$
 Wt. % A) $\pm 0.25\%$

2. Systems of More than Two Components

I₂
B = CHI₃
 Iodoform
C = CH₂I₂
 Methylene iodide (260)

B = CH₂I₂
 Methylene iodide
C = C₆H₆ (260)

B = CH₂I₂
 Methylene iodide
C = C₈H₁₀
 Xylene (260)

B = CHI₃
 Iodoform
C = CH₂I₂
 Methylene iodide
D = C₈H₁₀
 Xylene (260)

S
B = CS₂ (174, 297)
 Wt. % A | d_4^{15}
 ($\pm 0.05\%$)(239)
 0 | 1.2708
 2 | 1.2802
 4 | 1.2901
 6 | 1.2998
 8 | 1.3096
 10 | 1.3195
 12 | 1.3297
 14 | 1.3399
 16 | 1.3502
 18 | 1.3604
 20 | 1.3709
 $d_4^{15} = d_4^t \left(\frac{1 + at + bt^2}{1 + 15a + 225b} \right)$
 a = 0.0011398
 b = 0.05137

B = C₃H₆O
 Acetone (116)^{1,2}

S_π
B = CS₂ (7)
B = C₇H₈ (7)
 Toluene

S_x
B = C₇H₈
 Toluene (7)

Se
B = CH₂I₂
 Methylene iodide (258)

P
B = C₄H₁₀O
 Ethyl ether (45)²
B = C₆H₆ (45)²

B = KI
C = CH₄O
 Methyl alcohol
 $\pm 0.1\%$ (357)
 Wt. %

A	B	C	$d_4^{25.6}$
14.27	0.00	85.73	0.8899
12.61	2.06	85.33	0.8950
12.40	2.32	85.28	0.8958
12.13	2.65	85.22	0.8975
11.78	3.09	85.13	0.8976
11.31	3.70	84.99	0.8978

B = CHI₃
 Iodoform
C = CH₂I₂
 Methylene iodide
D = C₆H₆ (260)

SEC. II. ALL COMPONENTS ARE CHEMICAL COMPOUNDS
NONE OF WHOSE KEY-FORMULAE BEGINS WITH 16.
STANDARD ARRANGEMENT

1. Two-Component Systems

HCl

B = SbCl₃ (17)

B = BiCl₃ (17)

H₂SO₄

B = HNO₃

(±0.25 %)(229)

a | 10³b

(4° - 30°)

5 Wt. % B

1.862 | 1.077(t - 4)

(5° - 28°)

10 Wt. % B

1.872 | 1.000(t - 5)

(3° - 27°)

15 Wt. % B

1.883 | 1.083(t - 3)

(4° - 31°)

22 Wt. % B

1.873 | 1.186(t - 4)

(4° - 36°)

28 Wt. % B

1.864 | 0.969(t - 4)

(5° - 30°)

44 Wt. % B

1.814 | 1.400(t - 5)

(4° - 35°)

51 Wt. % B

1.761 | 1.456(t - 4)

(4° - 25°)

59 Wt. % B

1.732 | 1.857(t - 4)

(5° - 35°)

65 Wt. % B

1.715 | 1.534(t - 5)

(4° - 30°)

75 Wt. % B

1.672 | 1.577(t - 4)

B = ZrO₂

(±1.0 %)(42)

Wt. % A	d ₄ ^{12.4}
88.89	2.05
80.00	2.20
66.67	2.50
61.55	2.78
57.20	3.02
53.30	3.20
50.00	3.40
47.00	3.45
45.45	3.47
44.40	3.49
43.50	3.52
41.70	3.57
40.00	3.62
36.35	3.65
33.33	3.69
28.57	3.79
25.00	3.87

N₂O₃

B = N₂O₄

(±0.25 %)(230)

a | 10³b

(-5° to +5°)

0 Wt. % A

1.500 | 2.0(t + 5)

(-14° to +5°)

12 Wt. % A

1.512 | 1.58(t + 14)

(-5° to +5°)

20 Wt. % A

1.488 | 2.2(t + 5)

(-5° to 0°)

30 Wt. % A

1.482 | 2.0(t + 5)

(-10° to -5°)

75 Wt. % A

1.470 | 2.4(t + 10)

100 Wt. % A

1.453 | 2.0(t + 10)

N₂O₄

B = HNO₃ (230)

(±0.05 %)(26)

Wt. % B	d ₄ ⁴
100.00	1.5375
98.78	1.5417
91.98	1.5687
83.12	1.6026
73.91	1.6329
65.07	1.6536
62.40	1.6577
57.99	1.6629
56.29	1.6636
53.30	1.6634
51.34	1.6627
50.04	1.6618
48.63	1.6602
46.90	1.6564
3.07	1.4852
1.51	1.4837
0.00	1.4823

Wt. % B	d ₄ ¹¹
100.00	1.5228
98.78	1.5291
91.98	1.5567
83.12	1.5911
73.91	1.6212
65.07	1.6417
62.40	1.6456
57.99	1.6502
56.29	1.6509
53.30	1.6504
51.34	1.6494
50.04	1.6484
48.63	1.6463
46.90	1.6421
3.07	1.4693
1.51	1.4679
0.00	1.4663

Wt. % B

d₄¹³

100.00	1.5120
98.78	1.5164
91.98	1.5446
83.12	1.5793
73.91	1.6093
65.07	1.6294
62.40	1.6332
57.99	1.6375
56.29	1.6379
53.30	1.6371
51.34	1.6357
50.04	1.6343
48.63	1.6320
46.90	1.6270
3.07	1.4532
1.51	1.4517
0.00	1.4500

NH₃

B = NH₄Br

(±0.25 %)(83)

Wt. % B	d ₄ ^{-33.5}
62.01	1.001
59.30	0.987
37.61	0.852
25.71	0.792
20.09	0.764
15.04	0.742
8.36	0.727
7.53	0.710
4.17	0.697

B = Cu(NO₃)₂·4NH₃

(±0.25 %)(83)

35.94	0.908
22.17	0.806
11.53	0.741
6.49	0.715
4.28	0.700
2.37	0.692
1.14	0.686
0.62	0.684

B = AgI

(±0.25 %)(83)

78.25	2.299
62.60	1.573
42.35	1.113
40.30	1.077
27.94	0.918
26.45	0.899
14.49	0.786
12.08	0.768
8.38	0.738
6.98	0.727
3.49	0.696
1.91	0.694

B = AgNO₃

(±0.25 %)(83)

15.69	0.798
9.18	0.746
4.60	0.713
2.55	0.698

Wt. % B

d₄^{23.5}

1.91	0.692
1.05	0.687
0.51	0.684
0.28	0.682

B = NaNO₃

(±0.25 %)(83)

36.88	0.947
20.54	0.813
12.04	0.755
8.73	0.731
5.74	0.713
3.22	0.697
1.56	0.690
0.85	0.686

B = KI

(±0.25 %)(83)

56.90	1.290
36.00	0.978
22.70	0.843
21.71	0.838
12.99	0.766
6.59	0.723
3.68	0.704

(NH₄)₂SO₄

B = ZrOSO₄

(±1.0 %)(43)

Mol % A	d ₄ ^{23.5}
20.00	2.95
33.33	2.74
39.88	2.59
50.00	2.50
60.00	2.35
66.67	2.20
75.00	2.20

B = K₂SO₄

(±0.25 %)(259)

Wt. % B	t	d ₄
0.00		2.666
5.45	23.0	2.574
8.33	20.5	2.578
15.03	20.0	2.474
18.45	20.0	2.451
20.55	20.5	2.432
26.47	21.0	2.342
29.30	19.0	2.323
42.67	22.5	2.187
65.35	20.5	2.004
83.37	20.0	1.883
100.00		1.774

SbBr₃

B = AlBr₃

(±0.5 %)(137)

Wt. % B	d ₄ ^{29.5}
0.00	2.754
9.04	2.736?
14.65	2.806
20.15	2.875
27.76	2.969
100.00	3.845

SiO ₂	
B = 3NaF·AlF ₃	
Cryolite	
(±1.0%)(²³¹)	
Wt. % B	d_4^{20}
100	2.216
97	2.150

ZrOSO ₄	
B = Na ₂ SO ₄	
(±1.0%)(⁴³)	
Mol % B	$d_4^{23.12}$
20.00	3.37
33.33	3.22
39.88	3.12
50.00	3.08
60.00	3.02
66.67	2.95
75.00	2.82

ZrSiO ₄	
B = Li ₄ SiO ₄	
(±0.5%)(²⁸⁷)	
Mol % B	d_4^{20*}
100.0	2.280
90.0	3.145
80.0	3.356
75.0	3.382
70.0	3.401
66.7	3.410
65.0	3.449
60.0	3.479
50.0	3.601
40.0	4.024
35.0	3.905
30.0	4.124
0.0	4.510

* Approx.

PbO	
B = Fe ₂ O ₃	
(±0.5%)(¹⁵⁴)	
Wt. % B	d_4^{15}
0.00	9.514
5.00	9.150
19.26	8.531
25.00	8.170
30.00	7.745
39.78	7.296
41.72	7.194
48.52	6.936
50.68	6.712
51.47	6.705
59.88	6.337
63.60	6.119
71.74	5.974
77.66	5.793
81.61	5.661
90.29	5.353
100.00	5.190

PbCl ₂	
B = ZnCl ₂ (260)	
TiNO ₃	
B = TiC ₂ H ₃ O ₂	
Acetate (²⁶¹)	

ZnO	
B = CoO (109)	
HgCl ₂	
B = HgBr ₂	
(±0.5%)(³²¹)	
Wt. % B	d_4^{20}
0.00	5.45
26.90	5.61
72.41	5.92
93.11	5.96
100.00	6.06

HgBr ₂	
B = HgI ₂ (yellow)	
(±0.5%)(³²¹)	
Wt. % A	d_4^{20}
100.00	6.06
80.80	6.09
76.34	6.23
66.85	6.17
58.95	6.16
48.30	6.18
30.03	6.28
29.29	6.31
0.00	6.28

HgI ₂ (red)	
2.88	6.26
0.00	6.29

B = AlBr ₃	
(±0.5%)(¹³⁷)	
Wt. % B	$d_4^{20.5}$
0.00	2.754
9.96	2.827
18.42	3.028
28.14	3.263

HgI ₂	
B = BaI ₂ (260)	
B = KHgI ₃ (260)	

Cu ₂ Cl ₂	
B = KCl	
(to 11.49 Wt. % A)(²⁷¹)	
$d_4^{800} = (1.51 + 0.009575 \times$	
Wt. % A) ± 1.0%	

CuS	
B = Cu ₂ S	
(82.68 - 100 Wt. % B)(²⁴⁵)	
$d_4^t = (4.68 + 0.01101 \times$	
Wt. % B) ± 1.0%	
$d_4^{25} = (4.70 + 0.01105 \times$	
Wt. % B) ± 1.0%	

AgI	
B = AgNO ₃ (260)	
AgNO ₃	
B = NaNO ₃ (260)	
B = KNO ₃ (260)	

Fe ₂ O ₃	
B = CaO	
(±1.0%)(¹⁵⁵)	
Mol % B	d_4^{20*}
0.0	5.19
9.5	5.05

Mol % B	d_4^{20*}
10.0	5.03
15.0	4.96
17.5	4.88
22.0	4.85
27.0	4.79
30.0	4.83
33.3	4.72
37.5	4.74 ?
41.0	4.72
50.0	4.68
51.0	4.67
56.0	4.48
64.0	4.21
100.0	3.32

* Approx.

FeSO ₄ ·7H ₂ O		
B = MgSO ₄ ·7H ₂ O		
(±0.1%)(²⁵⁹)		
Wt. % A	t	d_4^t
Monoclinic		
100.00	20.0	1.898
94.28	19.0	1.884
86.01	20.0	1.867
83.84	19.5	1.860
78.92	20.5	1.847
78.06	21.0	1.842
68.84	20.5	1.827
66.55	21.0	1.821
58.98	20.5	1.807
56.79	20.0	1.799
45.93	21.0	1.781
0.00	20.0	1.691
Rhombic		
100.00	20.0	1.875
18.78	20.0	1.711
11.84	21.0	1.697
5.84	21.0	1.687
0.00	20.0	1.677

Nb ₂ O ₅	
B = Ta ₂ O ₅ (167, 184)	
(±0.75%)(⁸⁴)	
Wt. % A	d_4^{20}
100	4.548
95	4.645
90	4.741
80	4.924
70	5.195
60	5.469
50	5.844
40	6.428
35	6.730
30	7.076
25	7.434
20	7.646
15	7.953
10	8.090
5	8.235
0	8.705

Al ₂ O ₃	
B = 3NaF·AlF ₃	
Cryolite	
(±1.0%)(²³¹)	

Wt. % B	t	d_4^t
100	995	2.216
95	970	2.142
90	960	2.115
80	950	2.154
76	935	2.260

AlBr ₃	
B = KBr	
(±0.5%)(¹³⁷)	
Wt. % B	$d_4^{20.5}$
0.00	2.754
11.93	2.803
19.01	2.830

(NH ₄) ₆ Al ₂ (C ₂ O ₄) ₆ ·6H ₂ O	
B = Na ₆ Al ₂ (C ₂ O ₄) ₆ ·9H ₂ O (³⁰⁰)	

Al ₂ (SiO ₃) ₃	
B = Li ₂ SiO ₃ (11)	

Al ₄ (SiO ₄) ₃	
B = Li ₄ SiO ₄ (11)	

Ti ₂ SO ₄ ·Al ₂ (SO ₄) ₃ ·24H ₂ O	
B = K ₂ SO ₄ ·Al ₂ (SO ₄) ₃ ·24H ₂ O	
(±0.25%)(²⁵⁹)	

Wt. % B	t	d_4^t
0.00		2.318
9.62	19.0	2.246
19.32	21.0	2.190
21.15	20.0	2.110
30.98	20.0	2.109
33.70	19.0	2.070
47.13	25.0	2.015
53.86	25.0	1.985
56.16	24.0	1.966
68.43	26.0	1.898
72.42	23.0	1.877
75.18	25.5	1.864
84.54	21.0	1.821
100.00		1.752

MgSiO ₃	
B = CaSiO ₃	
(±1.0%)(³¹⁰)	
Vol. % B	d_4^{20}
0.00	2.758
4.76	2.777
9.54	2.781
28.92	2.823
38.76	2.835
52.35	2.854
58.75	2.858
62.80	2.872
72.99	2.881
84.60	2.891
94.75	2.899
100.00	2.904

CaO·Al ₂ O ₃ ·2SiO ₂	
Anorthite	
B = Na ₂ O·Al ₂ O ₃ ·6SiO ₂	
Albite	

($\pm 1.0\%$)(³¹⁰)	
Wt. % B	d_4^{20*}
100.00	2.382
65.39	2.483
48.50	2.533
32.20	2.591
15.90	2.648
0.00	2.700

CaF₂

Fluorspar

B = 3NaF.AlF₃

Cryolite

($\pm 1.0\%$)(²³¹)

Wt. % A	t	d_4^t
0.0	995	2.216
12.0	985	2.310
25.4	1000	2.474

Ca₂SiO₄B = Li₄SiO₄($\pm 0.5\%$)(²⁸⁷)

Mol % A	d_4^{20*}
0	2.280
10	2.400
20	2.423
25	2.436
30	2.424
35	2.478
40	2.591
45	2.636
50	2.847?
55	2.669
60	2.566?
100	2.970

CaO.MgO.Al₂O₃.SiO₂

Gehlenite

B = 2CaO.MgO.2SiO₂

Åkermanite

($\pm 0.1\%$)(⁸⁰)

For crystals

$$d_4^{25} = 3.038 - 0.0394 \times$$

Wt. % B

For glasses

$$d_4^{25} = 2.884 + 0.0371 \times$$

Wt. % B

NaNO₃B = KNO₃($\pm 1.0\%$)(²⁹⁸)

(35.3 Wt. % A)(230° - 390°)

a	10 ³ b
1.968	0.75(t - 230)

* Approx.

KCl

B = KBr

($\pm 0.5\%$)(³⁰⁴)

Wt. % B	d_4^{17*}
0.0	1.994
27.3	2.213
43.3	2.236
61.5	2.386
75.6	2.518
90.4	2.649
92.8	2.667
100.0	2.744

B = KCl.MgCl₂.6H₂O($\pm 1.0\%$)(^{6, 160})

Wt. % A	d_4^{550}
0.5	1.72
4.8	1.71
7.7	1.71
11.5	1.71
13.8	1.69
Wt. % A	d_4^{650}
0.0	1.68
0.5	1.68
4.8	1.67
7.7	1.67
11.5	1.66
13.8	1.66
Wt. % A	d_4^{750}
0.0	1.64
0.5	1.64
4.8	1.63
7.7	1.63
11.5	1.62
13.8	1.61

KNO₃B = RbNO₃($\pm 1.0\%$)(³⁰¹)

Wt. % B	d_4^{20*}
0.0	2.11
6.9	2.14
12.6	2.15
28.8	2.23
30.1	2.25
30.4	2.22
31.4	2.24
32.6	2.25
43.5	2.32
46.5	2.35
47.9	2.34
48.3	2.35
50.6	2.36

* Approx.

SEC. III. ALL COMPONENTS CHEMICAL COMPOUNDS

One component (the A-component) has a key-formula which does not begin with 16. All other components have key-formulae beginning with 16. Standard arrangement by A-components. The B (resp. C) components take the C-arrangement.

1. Two-Component Systems**HCl**B = CH₄OMethyl alcohol (^{358.5})B = C₂H₆O

Ethyl alcohol

($\pm 0.05\%$)(¹⁴⁶) cf. (^{358.5})

Wt. % A	d_4^{25}
0.00	0.7851
1.27	0.7907
5.22	0.8174
13.47	0.8642

B = C₄H₁₀O

n-Butyl alcohol

($\pm 0.1\%$)(³³⁷)

0	0.8060
1	0.8130
2	0.8195
3	0.8255
4	0.8315
5	0.8370
6	0.8425
7	0.8485
8	0.8540
9	0.8590
10	0.8635
11	0.8685
12	0.8730
13	0.8770
14	0.8810
15	0.8855
16	0.8895
17	0.8935
18	0.8960
19	0.9010
20	0.9050

HBrB = C₂H₆OEthyl alcohol (^{358.5})**SO₂**B = CCl₄ (^{170.1})*B = CS₂ (^{170.1})B = CHCl₃Chloroform (^{170.1})B = CH₄O (^{170.1})*

Methyl alcohol

B = C₃H₈O

Acetone

($\pm 0.25\%$)(^{170.1})*

Wt. % A	d_4^{25}
0.00	0.7850
5.34	0.8050
18.02	0.8570
22.22	0.8761
26.52	0.8972
30.62	0.9130
42.44	0.9705

B = C₄H₁₀O

Ethyl ether

($\pm 0.25\%$)(^{170.1})*

0.00	0.7084
5.00	0.7278
8.33	0.7423
11.70	0.7564
14.20	0.7674

B = C₆H₆($\pm 0.25\%$)(^{170.1})*

0.00	0.8714
2.72	0.8804
4.52	0.8872
7.38	0.8954

B = C₇H₈

Toluene

($\pm 0.25\%$)(^{170.1})*

0.00	0.8602
1.29	0.8632
3.21	0.8699
7.48	0.8812
14.00	0.9088

* Data are also given for these systems under pressure of liquid SO₂ at 25°.

B = C₇H₁₆Heptane (^{170.1})B = C₈H₁₀

Xylene

($\pm 0.25\%$)(^{170.1})

Wt. % A	d_4^{25}
0.00	0.8590
3.52	0.8676
5.00	0.8744
6.72	0.8779
8.78	0.8859
10.92	0.8921
15.43	0.9029

B = C₁₀H₁₆O

Camphor

(to 79.49 Wt. % B)(²⁷⁷)

$$d_4^{20} = (1.092 - 0.02381 \times$$

$$(\text{Wt. \% B} - 64.52) \pm 0.1\%$$

H₂SB = CHCl₃Chloroform (^{170.1})**H₂SO₄**B = C₂H₄O₂

Acetic acid

($\pm 0.075\%$)(^{68, 150})

Wt. % B	d_4^{15}
0.00	1.8405
9.93	1.7582
29.88	1.5920
50.12	1.4222
70.07	1.2708

2. Three-Component SystemsAl₂O₃; B = CaF₂; C = 3NaF.AlF₃, Cryolite ($\pm 1.0\%$)(²³¹)

Wt. %			t	d_4^t
A	B	C		
9.09	9.09	81.82	985	2.219
17.75	11.25	71.00	1010	2.228
7.50	25.00	67.50	985	2.275

Wt. %			t	d_4^t
A	B	C		
11.90	25.70	64.30	1010	2.305
17.70	23.00	59.30	1000	2.330
14.30	28.50	57.20	1000	2.385

H₂SO₄—(Continued)**B = C₂H₄O₂—(Continued)**

Wt. % B	d_4^{15}
90.01	1.1243
100.00	1.0550
Wt. % B	$d_4^{76.5}$
0.00	1.7791
9.93	1.6986
29.88	1.5290
50.12	1.3565
70.07	1.2025
90.01	1.0547
100.00	0.9853

B = C₂H₆O₄S

Dimethyl sulfate

 $(\pm 0.075\%)$ (68, 150)

Wt. % A	d_4^0
100.00	1.8546
75.02	1.6955
49.85	1.5732
24.98	1.4483
0.00	1.3516
Wt. % A	$d_4^{76.5}$
100.00	1.7791
75.02	1.6146
49.85	1.4882
24.98	1.3593
0.00	1.2576

B = C₄H₁₀O

Ethyl ether (38)

 $(\pm 0.05\%)$ (246)

Wt. % A	d_4^{30}
100.00	1.8284
98.68	1.7954
98.00	1.7793
97.39	1.7686
93.18	1.6932
92.97	1.6897
91.55	1.6656
84.86	1.5595
78.09	1.4613
72.04	1.3831
64.90	1.2991
58.34	1.2170
52.14	1.1469
46.21	1.0834
43.04	1.0518
39.16	1.0131
29.62	0.9257
28.54	0.9169
21.80	0.8580
16.79	0.8188
9.84	0.7668
0.00	0.7024

S₂Cl₂**B = C₁₀H₁₆O**

Camphor

 $(\pm 0.1\%)$ (277)

Wt. % A	d_4^{20}
100.00	1.677
96.56	1.635
90.11	1.562
79.83	1.456

NH₃**B = CH₄O**

Methyl alcohol (56)

B = CH₄N₂O

Urea

 $(\pm 0.25\%)$ (83)

Wt. % A	$d_4^{-33.5}$
83.21	0.752
84.28	0.751
90.43	0.721
92.09	0.714
94.60	0.700
95.28	0.700
97.41	0.692

B = C₂H₆OEthyl alcohol (56, 299)²**NH₄NO₃****B = CH₃NO**

Formamide

 $(\pm 0.05\%)$ (360)

Wt. % A	d_4^{25}
3.500	1.1436
1.760	1.1376
0.707	1.1330
0.000	1.1302

B = CH₄O

Methyl alcohol

 $(\pm 0.05\%)$ (135)

Wt. % A	d_4^{16}
0.00	0.7941
5.68	0.8297
13.25	0.8584

B = C₂H₆O

Ethyl alcohol (104, 303)

NH₄Cl**B = CH₄O**Methyl alcohol (118)^{1,2}**B = C₂H₆O**Ethyl alcohol (104, 118)^{1,2}**B = C₃H₈O**Propyl alcohol (118)^{1,2}**B = C₃H₈O₃**Glycerol (116)¹ $(\text{to } 6.75 \text{ Wt. \% A})(44)$ $d_4^{18} = (1.2646 + 0.03918 \times \text{Wt. \% A}) \pm 0.05\%$ **NH₄ClO₄****B = CH₄O**Methyl alcohol (338)^{1,2}**B = C₂H₆O**Ethyl alcohol (338)^{1,2}**B = C₃H₆O**Acetone (338)^{1,2}**B = C₃H₈O***n*-Propyl alcohol (338)^{1,2}**B = C₄H₈O₂**Ethyl acetate (338)^{1,2}**B = C₄H₁₀O***n*-Butyl alcohol (338)^{1,2}**B = C₄H₁₀O**Isobutyl alcohol (338)^{1,2}**NH₄Br****B = CH₄O**Methyl alcohol (118)^{1,2}**B = C₂H₆O**

Ethyl alcohol (118, 1,2 303)

B = C₃H₈OPropyl alcohol (118)^{1,2}**NH₄I****B = C₂H₆O**Ethyl alcohol (297)²**B = C₅H₁₂O**

Isoamyl alcohol

 $(\text{to } 3.23 \text{ Wt. \% A})(153)$ $d_4^{25} = (0.8110 + 0.00613 \times \text{Wt. \% A}) \pm 0.1\%$ **PCl₃****B = CS₂** (142)**B = C₆H₆** (142)**B = C₁₀H₁₆O**

Camphor

 $(\pm 0.1\%)$ (277)

Wt. % A	d_4^{-10}
100.00	1.6545
73.87	1.4031
57.92	1.2865
Wt. % A	d_4^0
100.00	1.6146
96.93	1.5865
93.27	1.5538
81.70	1.4498
73.87	1.3888
57.92	1.2753
40.89	1.1716

Wt. % A	d_4^{20}
100.00	1.5794
98.95	1.5714
98.81	1.5678
96.93	1.5519
93.27	1.5190
89.97	1.4878
73.87	1.3601
57.92	1.2516
40.89	1.1510
Wt. % A	d_4^{40}
100.00	1.5451
93.27	1.4825
81.70	1.3870
73.87	1.3311
57.92	1.2304
40.89	1.1281

AsI₃**B = CH₂I₂**

Methylene iodide (258)

SbCl₃**B = C₂H₂Cl₄**

Tetrachloroethane

 $(\text{to } 28.81 \text{ Wt. \% A})(58)$ $\frac{1}{d_4^{25}} = (0.62929 - 0.0226018 \times \text{Wt. \% A}) - 0.0518335(\text{Wt. \% A})^2$ **B = C₃H₆O**

Acetone (163.1, 196, 279)

 $(\pm 0.05\%)$ (164)

Mol % A	d_4^{25}
0.0	0.7868
25.0	1.4007
33.4	1.5893
50.0	1.9564
62.0	2.2670
66.7	2.3178
Mol % A	d_4^{50}
25.0	1.3619
33.4	1.5709
50.0	1.9084
66.7	2.2155
70.0	2.3081
75.0	2.3624
77.0	2.4007
80.0	2.4585
100.0	2.7302
Mol % A	d_4^{70}
66.7	2.1842
70.0	2.2665
75.0	2.3397
77.0	2.3710
80.0	2.4392

B = C₄H₈O₂Ethyl acetate (111, 198)²**B = C₄H₁₀O**

Ethyl ether (163.1)

 $(\pm 0.05\%)$ (164)

Mol % A	d_4^{25}
0.0	0.7080
25.0	1.2170
33.4	1.4125
50.0	1.7694
70.0	2.1993
75.0	2.2943
80.0	2.3971
85.0	2.4882
Mol % A	d_4^{32}
0.00	0.6999
25.00	1.2062
33.4	1.4023
50.0	1.7619
70.0	2.1865
75.0	2.2815
80.0	2.3822
85.0	2.4735
Mol % A	d_4^{50}
70.0	2.1498
75.0	2.2502
80.0	2.3402
85.0	2.4344
100.0	2.7302
Mol % A	d_4^{75}
70.0	2.1019
75.0	2.2012
80.0	2.2897
85.0	2.3933
100.0	2.5705

B = C₆H₆ (163.1)
Mol % A | d₄⁷⁵
(±0.05%)(163)

0.0	0.8180
25.0	1.2907
33.4	1.4325
50.0	1.8127
66.6	2.0811
75.0	2.2279
85.0	2.4156
100.0	2.6704

B = C₆H₇N

Aniline (163.1)
(±0.05%)(163)

Wt. % A	d ₄ ⁹⁵
0.00	0.9554
44.76	1.4222
54.87	1.5794
66.55	1.7987
70.86	1.8866
72.88	1.9331
74.82	1.9793
82.94	2.1704
100.00	2.6267

Wt. % A	d ₄ ¹²⁵
0.00	0.9285
44.76	1.3870
70.86	1.8411
72.88	1.8855
74.82	1.9299
100.00	2.5567

B = C₁₀H₈

Naphthalene (163.1)
(±0.05%)(163)

Wt. % A	d ₄ ⁸⁰
0.00	0.9790
63.87	1.6612
77.95	1.9477
84.13	2.1084
85.89	2.1539
87.61	2.2036
94.09	2.4325
100.00	2.6626

Wt. % A	d ₄ ⁹⁰
0.00	0.9696
10.00	1.0349
20.00	1.1047
37.08	1.2669
46.26	1.3914
63.87	1.6127
72.62	1.8138
77.95	1.9417
80.94	1.9877
84.13	2.0919
87.61	2.1924
90.92	2.2941
94.09	2.4040
100.00	2.6333

Wt. % A	d ₄ ¹⁵⁰
0.00	0.9265
63.87	1.5668
77.95	1.8960
84.13	2.0019
87.61	2.0886
94.09	2.3026
97.11	2.4091
100.00	2.4936

B = C₁₃H₁₂
Diphenylmethane (163.1)
(±0.05%)(163)

Wt. % A	d ₄ ¹⁰⁰
0.00	0.9444
57.38	1.4928
71.55	1.7581
80.16	1.9565
84.34	2.0702
88.41	2.1893
100.00	2.6156

B = C₁₉H₁₆

Triphenylmethane (163.1)
(±0.05%)(163)

0.00	1.0195
31.67	1.2625
38.20	1.3316
43.14	1.3879
48.11	1.4444
64.97	1.6930
100.00	2.6156

SbBr₃

B = C₈H₈O

Acetophenone (163.1)
(±0.05%)(163)

Mol % A	d ₄ ²⁵
0	1.0224
25	1.6498
40	2.0599
45	2.1938
48	2.2822
50	2.3498
51	2.3831
60	2.6179
70	2.8375
85	3.1163

Mol. % A	d ₄ ⁵⁰
0	0.9981
25	1.6248
40	2.0266
45	2.1638
48	2.2445
50	2.2955
51	2.3227
52	2.3668
60	2.5693
70	2.7912
85	3.0874

Mol % A	d ₄ ⁹⁵
0	0.9891
25	1.5974
40	1.9969
45	2.1339
48	2.2145
50	2.2571
51	2.2899
52	2.3242
54	2.3801
60	2.5065
70	2.7671
85	3.0186
100	3.6894

B = C₁₃H₁₀O

Benzophenone (163.1)
(±0.05%)(163)

Wt. % A	d ₄ ²⁵
0.00	1.1063
49.70	1.7215
66.40	2.1172
70.72	2.2509
74.78	2.3906
79.81	2.5910
Wt. % A	d ₄ ⁹⁵
0.00	1.0496
49.70	1.6342
66.40	2.0076
74.78	2.2678
79.81	2.4525
82.18	2.5553
85.57	2.7142
100.00	3.6894

B = C₁₉H₁₆

Triphenylmethane (163)
(±0.05%)(163.1)

Wt. % A	d ₄ ⁷⁵
32.95	1.3536
59.58	1.8140
68.86	2.0539
74.67	2.2454
77.47	2.3451
81.56	2.5206
Wt. % A	d ₄ ⁹⁵
0.00	1.0191
32.95	1.3342
59.58	1.7874
68.86	2.0248
74.67	2.2156
77.47	2.3141
81.56	2.4884
100.00	3.6894

Wt. % A	d ₄ ¹⁰⁰
0.00	1.0195
49.56	1.5815
54.67	1.6773
59.58	1.7822
68.86	2.0206
74.67	2.2005
81.56	2.4068
100.00	3.6775

SbI₃

B = CH₂I₂

Methylene iodide (258)

BiCl₃

B = C₃H₆O

Acetone (196, 279)

B = C₄H₈O₂

Ethyl acetate (111, 198)

BiI₃

B = CH₂I₂

Methylene iodide (258)

For systems, all components of
which are compounds of C
with elements of key
numbers 2 to 15,
see p. 143

SnCl₂

B = C₂H₆O

Ethyl alcohol
(±0.05%)(44)

Wt. % A	d ₄ ¹⁶
16.10	0.8956
8.53	0.8455
0.00	0.7951

B = C₃H₆O

Acetone (196, 325)²

B = C₄H₈O₂

Ethyl acetate (111, 198)²

SnCl₄

B = CS₂

(±0.05%)(290)

Wt. % A	d ₄ ²⁵
0.00	1.2560
13.83	1.3317
27.24	1.4168
38.60	1.4985
44.31	1.5438
66.38	1.7504
80.72	1.9168
100.00	2.2078

B = CHCl₃

Chloroform (290)¹

B = C₃H₆O₂

Ethyl formate (163.1)

(±0.05%)(164)

a | 10³b
(30°-50°)

0.0 Mol % A	
0.9083	1.290(t - 30)
25.0 Mol % A	
1.5216	1.320(t - 30)
30.0 Mol % A	
1.6379	1.470(t - 30)
32.0 Mol % A	
1.6832	1.625(t - 30)
33.5 Mol % A	
1.7046	1.600(t - 30)
36.0 Mol % A	
1.7323	1.635(t - 30)
50.0 Mol % A	
1.8638	1.740(t - 30)
75.0 Mol % A	
2.0540	2.190(t - 30)
100.00 Mol % A	
2.2042	2.620(t - 30)

B = C₄H₈O₂

Ethyl acetate (163.1)
(±0.05%)(164)

Mol % A	d ₄ ²⁵
0.0	0.8949
25.0	1.4735
32.6	1.5924
33.4	1.6031
34.6	1.6225
35.9	1.6372
50.0	1.7749
70.0	1.9469
100.0	2.2118

SnCl₄—(Continued)
B = C₄H₈O₂—(Continued)

Mol % A	d_4^{50}
0.0	0.8641
25.0	1.4393
32.6	1.5500
33.4	1.5613
34.6	1.5831
35.9	1.5986
50.0	1.7353
70.0	1.9177
100.0	2.1506
Mol % A	d_4^{70}
0.0	0.8355
25.0	1.4084
32.6	1.5136
33.4	1.5233
34.6	1.5427
35.9	1.5624
50.0	1.7022
70.0	1.8826
100.0	2.0949

B = C₄H₈O₂
Propyl formate (163.1)
(±0.05%)(164)

Wt. % A	d_4^{50}
0.0	0.8644
25.0	1.3943
32.0	1.5292
33.4	1.5537
35.0	1.5736
50.0	1.7320
75.0	1.9534
100.0	2.1506
Wt. % A	d_4^{70}
0.0	0.8406
25.0	1.3682
32.0	1.4952
33.4	1.5194
35.0	1.5408
50.0	1.6963
75.0	1.9091
100.0	2.0949

B = C₆H₁₀O₂
Ethyl propionate (163.1)
(±0.05%)(161)

Mol % A	d_4^{25}
0.00	0.8831
10.00	1.0662
25.00	1.3545
30.00	1.4494
33.33	1.5054
35.00	1.5326
40.00	1.5875
50.00	1.6960
60.00	1.8026
75.00	1.9625
90.00	2.1159
100.00	2.2118
Mol % A	d_4^{70}
0.00	0.8304
10.00	1.0082
25.00	1.2807
30.00	1.3656

Mol % A	d_4^{70}
33.33	1.4163
35.00	1.4440
40.00	1.5053
50.00	1.6178
60.00	1.7202
75.00	1.8656
90.00	2.0065
100.00	2.0949

B = C₆H₁₀O₂
Methyl butyrate
(±0.05%)(164)

Wt. % A	d_4^{25}
35.5	1.5071
100.0	2.2118
Wt. % A	d_4^{50}
35.5	1.4566
100.0	2.1506
Wt. % A	d_4^{70}
35.5	1.4161
100.0	2.0949

B = C₆H₆(163.1)
(±0.1%)(284)

Wt. % A	d_4^{20}
0	0.877
10	0.919
20	0.978
30	1.050
40	1.139
50	1.240
60	1.358
70	1.496
80	1.660
90	1.883
100	2.218

(±0.05%)(164)

Mol % A	d_4^{25}
0	0.8730
25	1.2715
50	1.6219
75	1.9027
100	2.2118

Mol % A	d_4^{70}
0	0.8243
25	1.2012
50	1.4826
75	1.8050
100	2.0949

B = C₆H₁₂O₂
Ethyl butyrate (163.1)
(±0.05%)(164)

Mol % A	d_4^{25}
0.0	0.8737
25.0	1.2922
30.8	1.3813
32.5	1.4198
33.3	1.4337
34.0	1.4430
34.5	1.4508
35.0	1.4569
36.0	1.4684
50.0	1.6249
75.0	1.9469
100.0	2.2118

Mol % A	d_4^{50}
0.0	0.8470
25.0	1.2562
30.8	1.3512
32.5	1.3773
33.3	1.3912
34.0	1.3995
34.5	1.4075
35.0	1.4146
36.0	1.4260
50.0	1.5865
75.0	1.9177
100.0	2.1507
Mol % A	d_4^{70}
0.0	0.8261
25.0	1.2245
30.8	1.3140
32.5	1.3392
33.3	1.3561
34.0	1.3629
34.5	1.3690
35.0	1.3771
36.0	1.3880
50.0	1.5549
75.0	1.8826
100.0	2.0949

B = C₉H₁₀O₂
Ethyl benzoate (163.1)
(±0.05%)(164)

Mol % A	d_4^{25}
0.0	1.0422
25.0	1.3567
33.4	1.4686
35.0	1.4852
37.5	1.5169
40.0	1.5455
45.0	1.6051
50.0	1.6606
70.0	1.8759
100.0	2.2118

Mol % A	d_4^{50}
0.0	1.0191
25.0	1.3156
33.4	1.4184
35.0	1.4398
37.5	1.4420
40.0	1.4994
45.0	1.5615
50.0	1.6173
70.0	1.8308
100.0	2.1506

Mol % A	d_4^{70}
0.0	1.0003
25.0	1.2994
33.4	1.3995
35.0	1.4072
37.5	1.4372
40.0	1.4642
45.0	1.5237
50.0	1.5807
70.0	1.7920
100.0	2.0949

SnI₄
B = CH₂I₂
Methylene iodide (258)
PbCl₂
B = C₅H₅N
Pyridine
(±0.075%)(119, 177)
0.00 Wt. % A

$$d_4^t = 1.1213(1 - 0.0377845 \times (t + 273))$$

0.10 Wt. % A

$$d_4^t = 1.2724(1 - 0.0377802 \times (t + 273))$$

PbC₄H₆O₄, Acetate
B = C₂H₆O
Ethyl alcohol (296)^{1,2}
PbC₃₆H₆₆O₄, Oleate
B = C₄H₁₀O
Ethyl ether (308)
PbC₃₆H₇₀O₄, Stearate
B = C₄H₁₀O
Ethyl ether (308)
PbC₄₈H₉₄O₄, Lignocerate
B = C₄H₁₀O
Ethyl ether (308)
ZnCl₂
B = C₃H₈O
Acetone (193, 196)
B = C₄H₁₀O
Ethyl ether
(±0.05%)(44)

Wt. % A	d_4^{22}
22.02	0.8964
17.40	0.8475
12.26	0.8045
5.53	0.7521
0.00	0.7132

ZnC₄H₆O₄, Acetate
B = C₂H₆O
Ethyl alcohol (296)^{1,2}
ZnC₁₀H₁₈O₄·2H₂O
Valerate dihydrate
B = C₂H₆O
Ethyl alcohol (296)^{1,2}
ZnC₁₂H₁₀S₂O₈·8H₂O
p-Phenolsulfonate octahydrate
B = C₂H₆O
Ethyl alcohol (296)^{1,2}
CdCl₂
B = C₂H₆O
Ethyl alcohol (139)
CdBr₂
B = C₂H₆O
Ethyl alcohol
(±0.25%)(139)

Wt. % A	d_4^{20}
0.00	0.790
17.07	0.943
25.91	1.045

B = C ₃ H ₆ O Acetone (193, 196)	
CdI₂	
B = CH ₄ O Methyl alcohol (to 11.555 Wt. % A)(97)	
$d_4^{20.5} = (0.7944 + 0.00714 \times \text{Wt. \% A}) \pm 0.05\%$	

B = C ₂ H ₃ N Acetonitrile (329) ¹	
--	--

B = C ₂ H ₆ O Ethyl alcohol (139) ($\pm 0.0075\%$)(264)	
Wt. % A	$d_4^{13.5}$
0.000	0.79596
0.240	0.79764
0.478	0.79929
0.955	0.80259
1.896	0.80924
3.718	0.82235
(to 46.412 Wt. % A)(97)	
$d_4^{20.5} = (0.7893 + 0.00684 \times \text{Wt. \% A}) \pm 0.05\%$	

B = C ₃ H ₆ O Acetone (193, 196) ($\pm 0.0075\%$)(264)	
Wt. % A	$d_4^{13.2}$
0.000	0.79946
0.237	0.80114
0.477	0.80280
0.942	0.80606
1.890	0.81279
3.696	0.82589

B = C ₄ H ₈ O ₂ Ethyl acetate (111, 198)	
--	--

HgCl₂ B = C ₂ H ₃ N Acetonitrile (329) ¹	
---	--

B = C ₂ H ₆ O Ethyl alcohol (114, ¹ 117, ¹ 118, ¹ 303) ($\pm 0.0075\%$)(264)	
Wt. % A	$d_4^{14.20}$
0.000	0.79527
0.355	0.79777
0.566	0.80028
1.407	0.80523
2.769	0.81513
($\pm 0.01\%$)(33)	
Wt. % A	d_4^{20}
0.000	0.78090
6.789	0.83023
11.719	0.87011
18.676	0.93307

B = C ₃ H ₆ O Acetone (196, 325) ($\pm 0.05\%$)(44)	
Wt. % A	d_4^{18}
36.46	1.1712
15.31	0.9237
9.91	0.8753
0.00	0.8000

B = C ₃ H ₆ O ₂ Methyl acetate (21, 197 ²)	
B = C ₃ H ₈ O Propyl alcohol (118) ^{1,2}	

B = C ₄ H ₈ O ₂ Ethyl acetate (1, 114, ¹ 195 ²)	
--	--

B = C ₄ H ₁₀ O Ethyl ether (303) ²	
--	--

B = C ₅ H ₅ N Pyridine ($\pm 0.075\%$)(119, 177)	
0.00 Wt. % A	

$d_4^t = 1.1216(1 - 0.0377845 \times (t + 273))$	
13.96 Wt. % A	
$d_4^t = 1.4186(1 - 0.0374305 \times (t + 273))$	

HgBr₂ B = CH ₄ O Methyl alcohol (114, ¹ 117, ¹ 118 ^{1,2})	
--	--

B = C ₂ H ₆ O Ethyl alcohol (114, ¹ 117, ¹ 118 ^{1,2})	
--	--

B = C ₃ H ₆ O ₂ Methyl acetate (21, 197 ²)	
--	--

B = C ₃ H ₈ O Propyl alcohol (118) ^{1,2}	
--	--

B = C ₄ H ₈ O ₂ Ethyl acetate (114) ^{1,2}	
--	--

HgI₂ B = CH ₂ I ₂ Methylene iodide (257)	
--	--

B = CH ₄ O Methyl alcohol (114, ¹ 117, ¹ 118, ^{1,2} 297)	
---	--

B = C ₂ H ₃ N Acetonitrile (329) ¹	
--	--

B = C ₂ H ₆ O Ethyl alcohol (114, ¹ 116, ¹ 117, ¹ 118, ^{1,2} 297)	
--	--

B = C ₃ H ₈ O Propyl alcohol (118, ^{1,2} 297)	
---	--

B = C ₄ H ₈ O ₂ Ethyl acetate (114) ^{1,2}	
--	--

Hg(CN)₂ B = CH ₄ O Methyl alcohol (114, ¹ 117, ¹ 118 ^{1,2})	
--	--

B = C ₂ H ₆ O Ethyl alcohol (114, ¹ 117, ¹ 118 ^{1,2})	
--	--

B = C ₃ H ₈ O Propyl alcohol (118) ^{1,2}	
--	--

B = C ₄ H ₈ O ₂ Ethyl acetate (114) ^{1,2}	
--	--

B = C ₅ H ₅ N Pyridine ($\pm 0.075\%$)(119, 177)	
0.00 Wt. % A	

$$d_4^t = 1.1216(1 - 0.0377845 \times (t + 273))$$

$$25.46 \text{ Wt. \% A}$$

$$d_4^t = 1.5351(1 - 0.0370033 \times (t + 273))$$

CuCl₂ B = C ₂ H ₆ O Ethyl alcohol ($\pm 0.05\%$)(44)	
Wt. % A	$d_4^{14.5}$
7.84	0.8591
6.00	0.8440
4.06	0.8287
2.07	0.8135
0.00	0.7985

B = C ₃ H ₆ O Acetone (77, 196)	
--	--

B = C ₃ H ₆ O ₂ Methyl acetate (197, 262)	
---	--

B = C ₄ H ₈ O ₂ Ethyl acetate (1, 195)	
--	--

AgClO₄ B = C ₅ H ₅ N Pyridine (174.1) ^{1,2}	
--	--

B = C ₆ H ₆ (126) ^{1,2} B = C ₆ H ₇ N Aniline (127) ^{1,2}	
---	--

AgI B = CH ₅ N Methylamine ($\pm 0.25\%$)(83)	
Wt. % A	d_4^0
46.40	1.169
30.69	0.945
27.47	0.926
16.70	0.814
11.86	0.772
10.50	0.766
4.07	0.712
2.39	0.706
1.29	0.698
0.88	0.693

B = C ₂ H ₇ N Dimethylamine (358)	
--	--

AgNO₃ B = CH ₅ N Methylamine ($\pm 0.25\%$)(83)	
---	--

Wt. % A	d_4^0
48.20	1.260
41.30	1.136
31.08	1.042
25.08	0.934
24.22	0.900
20.45	0.865
16.90	0.853
12.08	0.783
4.81	0.752
4.22	0.750
4.17	0.720
2.85	0.709
2.40	0.706

Wt. % A	d_4^0
1.29	0.698
1.09	0.700
0.87	0.692
0.40	0.693
0.21	0.693
0.08	0.690

B = C ₂ H ₃ N Acetonitrile ($\pm 0.1\%$)(268)	
Wt. % A	d_4^{25}
0.00	0.778
4.80	0.814
14.07	0.893
31.91	1.092
56.93	1.541

B = C ₂ H ₇ N Ethylamine (358)	
---	--

B = C ₃ H ₆ O Acetone (193, 196 ²)	
---	--

B = C ₃ H ₉ N Propylamine (358)	
--	--

B = C ₅ H ₅ N Pyridine ($\pm 0.1\%$)(267)	
Wt. % A	d_4^{25}
0.00	0.977
4.04	1.018
9.59	1.055
14.88	1.129
26.07	1.280

B = C ₆ H ₆ ClN m-Chloroaniline (to 7.89 Wt. % A)(268)	
$d_4^{25} = (1.212 + 0.00109 \times \text{Wt. \% A}) \pm 0.1\%$	

B = C ₆ H ₇ N Aniline ($\pm 0.1\%$)(250, 267)	
Wt. % A	d_4^{25}
0.00	1.017
1.87	1.032
3.02	1.044
4.93	1.064
6.08	1.074
9.79	1.112
10.21	1.116
16.10	1.158
25.00	1.202
26.00	1.207

B = C ₉ H ₇ N Quinoline (to 5.92 Wt. % A)(267)	
$d_4^{25} = (1.091 + 0.01031 \times \text{Wt. \% A}) \pm 0.1\%$	

FeCl₃ B = C ₂ H ₆ O Ethyl alcohol (303)	
---	--

B = C ₃ H ₆ O Acetone (196, 279)	
---	--

CoCl₂ B = C ₃ H ₆ O Acetone (196, 325)	
--	--

CoBr₂	
B = C ₃ H ₆ O ₂	
Methyl acetate (197, 262)	
H₃BO₃	
B = CH ₄ O	
Methyl alcohol (190, 191 ²)	
B = C ₂ H ₆ O	
Ethyl alcohol (190, 191, 293)	
B = C ₃ H ₈ O	
n-Propyl alcohol (190, 191 ²)	
B = C ₃ H ₈ O ₃	
Glycerol (116) ^{1,2}	
B = C ₄ H ₁₀ O	
Isobutyl alcohol (190, 191 ²)	
B = C ₅ H ₁₂ O	
Isoamyl alcohol (190, 191 ²)	
AlCl₃	
B = CCl ₂ O	
Phosgene	
(±0.075%)(^{94.1})	
Wt. % A	d_4^{20}
0	1.4275
5	1.4530
10	1.4782
15	1.5027
20	1.5270
25	1.5505
30	1.5741
35	1.5972
40	1.6194
45	1.6416
50	1.6632
Wt. % A	d_4^{25}
0	1.3685
5	1.3966
10	1.4225
15	1.4483
20	1.4740
25	1.5000
30	1.5257
35	1.5512
40	1.5765
45	1.6018
50	1.6272
55	1.6526
MgCl₂	
B = C ₂ H ₆ O	
Ethyl alcohol	
(to 5.24 Wt. % A) (⁴⁴)	
$d_4^{22.5} = (0.7915 +$	
$0.009155 \times \text{Wt. \% A}) \pm 0.05\%$	
Mg(ClO₄)₂	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	
B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	
B = C ₃ H ₈ O	
Acetone (338) ^{1,2}	
B = C ₃ H ₈ O	
n-Propyl alcohol (338) ^{1,2}	

B = C ₄ H ₈ O ₂	
Ethyl acetate (338) ^{1,2}	
B = C ₄ H ₁₀ O	
n-Butyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Ethyl ether (338) ^{1,2}	
MgBr₂·2(C₂H₅)₂O	
B = C ₄ H ₁₀ O	
Ethyl ether (181)	
CaCl₂	
B = CH ₄ O	
Methyl alcohol	
(±0.005%)(³¹⁹)	
Wt. % A	$d_4^{12.87}$
0.000	0.79950
0.996	0.80879
2.070	0.81838
6.434	0.85790
8.549	0.87725
B = C ₂ H ₆ O	
Ethyl alcohol (303)	
(±0.005%)(³¹⁹)	
Wt. % A	$d_4^{12.87}$
0.000	0.79586
1.700	0.81007
3.675	0.82448
4.618	0.83145
(±0.05%)(⁴⁴)	
Wt. % A	d_4^{22}
0.00	0.7903
3.97	0.8190
7.68	0.8474
9.44	0.8604
11.15	0.8730
14.42	0.8984
17.50	0.9264
Ca(ClO₄)₂	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	
B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	
B = C ₃ H ₈ O	
n-Propyl alcohol (338) ¹	
B = C ₄ H ₈ O ₂	
Ethyl acetate (338) ^{1,2}	
B = C ₄ H ₁₀ O	
n-Butyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Ethyl ether (338) ^{1,2}	
CaBr₂	
B = C ₂ H ₆ O	
Ethyl alcohol	
(±0.25%)(¹³⁹)	
Wt. % A	d_4^{20}
0.00	0.790
10.36	0.885
20.81	0.997

Ca(NO₃)₂	
B = CH ₄ O	
Methyl alcohol (144, 359) ¹	
B = C ₂ H ₆ O	
Ethyl alcohol (144, 359) ¹	
(±0.1%)(¹⁸⁹)	
Wt. % A	d_4^{25}
0.00	0.7850
19.30	0.8500
35.89	0.9140
50.20	0.9800
62.80	1.0437
B = C ₃ H ₆ O	
Acetone (144, 359) ¹	
B = C ₃ H ₆ O ₂	
Methyl acetate (21, 197)	
SrCl₂	
B = C ₂ H ₆ O	
Ethyl alcohol	
(to 2.74 Wt. % A)(¹³⁹)	
$d_4^{20} = (0.790 + 0.01533 \times$	
Wt. % A) ± 0.25%	
Sr(ClO₄)₂	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	
B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	
B = C ₃ H ₈ O	
Acetone (338) ^{1,2}	
B = C ₃ H ₈ O	
n-Propyl alcohol (338) ^{1,2}	
B = C ₄ H ₈ O ₂	
Ethyl acetate (338) ^{1,2}	
B = C ₄ H ₁₀ O	
n-Butyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	
SrBr₂	
B = C ₂ H ₆ O	
Ethyl alcohol	
(±0.25%)(¹³⁹)	
Wt. % A	d_4^{20}
0.00	0.790
10.08	0.882
17.98	0.964
Sr(NO₃)₂	
B = CH ₃ NO	
Formamide	
(±0.05%)(³⁶⁰)	
Wt. % A	d_4^{25}
4.528	1.1676
1.848	1.1457
0.000	1.1310
SrC₁₄H₁₀O₆·2H₂O	
Salicylate dihydrate	
B = C ₂ H ₆ O	
Ethyl alcohol (294, 296 ^{1,2})	
Ba(ClO₄)₂	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	

B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	
B = C ₃ H ₆ O	
Acetone (338) ^{1,2}	
B = C ₃ H ₈ O	
n-Propyl alcohol (338) ^{1,2}	
B = C ₄ H ₈ O ₂	
Ethyl acetate (338) ^{1,2}	
B = C ₄ H ₁₀ O	
n-Butyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	
BaBr₂	
B = CH ₄ O	
Methyl alcohol	
(±0.05%)(¹³⁵)	
Wt. % A	d_4^{16}
0.00	0.7941
12.55	0.9125
17.85	0.9701
Ba(NO₃)₂	
B = CH ₃ NO	
Formamide	
(±0.05%)(³⁶⁰)	
Wt. % A	d_4^{25}
5.548	1.1785
2.272	1.1504
0.000	1.1313
LiCl	
B = CH ₄ O	
Methyl alcohol	
(±0.05%)(⁴⁴)	
Wt. % A	$d_4^{14.5}$
17.49	0.9288
13.11	0.8933
9.41	0.8655
5.12	0.8348
0.00	0.7976
B = CH ₅ N	
Methylamine	
(to 10.9 Wt. % A)(⁸³)	
$d_4^0 = [0.690 + 0.00841 \times$	
(Wt. % A - 0.32)] ± 0.25%	
B = C ₂ H ₆ O	
Ethyl alcohol	
(±0.05%)(⁴⁴)	
Wt. % A	$d_4^{14.5}$
10.04	0.8693
7.69	0.8502
5.24	0.8340
2.68	0.8161
0.00	0.7966
B = C ₄ H ₁₀ O	
n-Butyl alcohol (337) ¹	
B = C ₅ H ₁₂ O	
Amyl alcohol	
(±0.05%)(⁴)	
Wt. % A	d_4^{25}
9.32	0.8466
6.48	0.8432
5.73	0.8392
5.11	0.8298

Wt. % A	d_4^{25}
3.44	0.8244
2.60	0.8156
1.31	0.8115
0.66	0.8095
0.33	0.8081
0.17	0.8077
0.09	0.8073
0.05	0.8070
0.03	0.8070
0.02	0.8071
0.01	0.8070
0.00	0.8070

B = C ₈ H ₈ O	
Acetophenone	
(to 0.25 Wt. % A)(188)	
$d_4^{25} = [(1.0238 + 0.871) \times$	
Wt. % A] $\pm 0.1\%$	

LiClO ₄ *	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	

B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	

B = C ₃ H ₈ O	
Acetone (338) ^{1,2}	

B = C ₃ H ₈ O	
<i>n</i> -Propyl alcohol (338) ^{1,2}	

B = C ₄ H ₈ O ₂	
Ethyl acetate (338) ^{1,2}	

B = C ₄ H ₁₀ O	
<i>n</i> -Butyl alcohol (338) ^{1,2}	

B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	

B = C ₄ H ₁₀ O	
Ethyl ether (338) ^{1,2}	

* Data are also given for LiClO₄·3H₂O in the various solvents listed.

LiBr	
B = C ₈ H ₈ O	
Acetophenone	
(to 0.5 Wt. % A)(188)	
$d_4^{25} = (1.0238 + 0.00871 \times$	
Wt. % A) $\pm 0.1\%$	

LiCHO ₂ , Formate	
B = CH ₂ O ₂	
Formic acid	
($\pm 0.1\%$)(275)	
$d_4^{15} = 1.2224 + 0.0222c$	
$d_4^{25} = 1.2142 + 0.0210c$	
c = Mole A per l soln.	

B = CH ₃ NO	
Formamide	
($\pm 0.05\%$)(360)	
Wt. % A	d_4^{25}
2.279	1.1399
1.143	1.1358
0.458	1.1328
0.000	1.1314

Li ₃ C ₆ H ₅ O ₇ ·4H ₂ O	
Citrate tetrahydrate	
B = C ₂ H ₆ O	
Ethyl alcohol (296) ^{1,2}	

LiC ₇ H ₅ O ₂ , Benzoate	
B = C ₂ H ₆ O	
Ethyl alcohol (296) ^{1,2}	

LiC ₇ H ₅ O ₃ · $\frac{1}{2}$ H ₂ O	
Salicylate hemihydrate	
B = C ₂ H ₆ O	
Ethyl alcohol (294, 296) ^{1,2}	

NaCl	
B = C ₃ H ₈ O ₃	
Glycerol (116) ^{1,2}	

B = C ₄ H ₁₀ O	
<i>n</i> -Butyl alcohol (337) ¹	

NaClO ₄	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	

B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	

B = C ₃ H ₈ O	
Acetone (338) ^{1,2}	

B = C ₃ H ₈ O	
<i>n</i> -Propyl alcohol (338) ^{1,2}	

B = C ₄ H ₈ O ₂	
Ethyl acetate (338) ^{1,2}	

B = C ₄ H ₁₀ O	
<i>n</i> -Butyl alcohol (337, 1,2 338) ^{1,2}	

B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	

NaBr	
B = CH ₄ O	
Methyl alcohol (118, 1 358.1)	
($\pm 0.05\%$)(135)	
Wt. % A	d_4^{15}
0.00	0.7941
7.36	0.8535
9.55	0.8730

B = C ₂ H ₆ O	
Ethyl alcohol (40, 118) ^{1,2}	

B = C ₃ H ₈ O	
Propyl alcohol (118) ^{1,2}	

NaI	
B = CH ₄ O	
Methyl alcohol (118, 1,2 358.1)	

B = C ₂ H ₆ O	
Ethyl alcohol (40, 118, 1,2	
153.2, 1,2 303, 358.5)	

B = C ₃ H ₈ O	
Acetone (174.2)	
($\pm 0.025\%$)(179)	
Wt. % A	d_4^{25}
0.00	0.8126
6.62	0.8643

Wt. % A	
d_4^{25}	
0.00	0.7875
6.62	0.8381
11.72	0.8841

Wt. % A	d_4^{25}
17.22	0.9361
22.33	0.9870

Wt. % A	d_4^{40}
0.00	0.7692
6.62	0.8200
11.72	0.8671
17.22	0.9171
22.33	0.9670

B = C ₃ H ₈ O	
Propyl alcohol (118) ^{1,2}	
($\pm 0.1\%$)(153)	
Wt. % A	d_4^{25}
0.00	0.8043
1.38	0.8141
1.43	0.8141
8.07	0.8626
9.25	0.8715
15.99	0.9256

B = C ₅ H ₁₂ O	
Isoamyl alcohol	
($\pm 0.1\%$)(153)	
Wt. % A	d_4^{25}
0.00	0.8110
3.58	0.8346
8.50	0.8712

B = C ₈ H ₈ O	
Acetophenone	
(to 0.9 Wt. % A)(188)	
$d_4^{25} = (1.0238 + 0.00871 \times$	
Wt. % A) $\pm 0.1\%$	

NaNO ₃	
B = CH ₃ NO	
Formamide	
($\pm 0.05\%$)(360)	
Wt. % A	d_4^{25}
3.680	1.1542
1.858	1.1429
0.748	1.1361
0.000	1.1314

B = CH ₅ N	
Methylamine	
($\pm 0.25\%$)(83)	
Wt. % A	d_4^{20}
11.86	0.770
6.70	0.729
4.62	0.713
2.76	0.695
1.46	0.703
0.99	0.696
0.56	0.693
0.07	0.690
0.04	0.687
0.03	0.686

NaCHO ₂ , Formate	
B = CH ₂ O ₂	
Formic acid	
$d_4^{18} = (1.2233 + 0.0335c)(275)$	
$d_4^{25} = (1.2142 + 0.0356c)(276)$	
c = Mole A per l soln. ($\pm 0.1\%$)	

B = CH ₃ NO	
Formamide	
($\pm 0.05\%$)(360)	
Wt. % A	d_4^{25}
2.968	1.1469
1.494	1.1393
0.599	1.1345
0.000	1.1314

NaC ₂ H ₃ O ₂ , Acetate	
B = C ₂ H ₆ O	
Ethyl alcohol (296) ^{1,2}	

Na ₂ C ₄ H ₄ O ₄ , Succinate	
B = CH ₃ NO	
Formamide (360) ¹	

NaC ₆ H ₅ O ₃ S	
Benzenesulfonate	
B = CH ₃ NO	
Formamide (360) ¹	

NaC ₇ H ₃ N ₂ O ₆	
3, 5-Dinitrobenzoate	
B = CH ₃ NO	
Formamide (360) ¹	

NaC ₇ H ₅ O ₂ , Benzoate	
B = CH ₃ NO	
Formamide (360) ¹	

B = C ₂ H ₆ O	
Ethyl alcohol (296) ^{1,2}	

NaC ₇ H ₅ O ₃ , Salicylate	
B = CH ₃ NO	
Formamide	
($\pm 0.05\%$)(360)	
Wt. % A	d_4^{25}
3.505	1.1417
1.411	1.1345
0.000	1.1306

B = C ₂ H ₆ O	
Ethyl alcohol (294, 296) ^{1,2}	

NaC ₇ H ₆ NO ₂	
<i>m</i> -Aminobenzoate	
B = CH ₃ NO	
Formamide (360) ¹	

NaC ₁₈ H ₃₃ O ₂ , Oleate	
B = C ₂ H ₆ O	
Ethyl alcohol (57)	

NaC ₆ H ₅ SO ₄ ·2H ₂ O	
<i>p</i> -Phenolsulfonate dihydrate	
B = C ₂ H ₆ O	
Ethyl alcohol (296) ^{1,2}	

Na ₂ CrO ₄ ·2H ₂ O	
B = C ₂ H ₆ O	
Ethyl alcohol (256)	

KCl	
B = CH ₄ O	
Methyl alcohol (115, 1,2 358.1)	

B = C ₃ H ₈ O ₃	
Glycerol (116) ^{1,2}	

KClO₄	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	
B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	
B = C ₃ H ₈ O	
Acetone (338) ^{1,2}	
B = C ₃ H ₈ O	
<i>n</i> -Propyl alcohol (338) ^{1,2}	
B = C ₄ H ₈ O ₂	
Ethyl acetate (338) ^{1,2}	
B = C ₄ H ₁₀ O	
<i>n</i> -Butyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	
KBr	
B = CH ₄ O	
Methyl alcohol (115, ^{1,2} 358.1)	
B = C ₃ H ₈ O ₃	
Glycerol (116) ^{1,2}	
KI	
B = CH ₃ NO ₂	
Nitromethane (330) ¹	
B = CH ₄ O	
Methyl alcohol (115, ¹ 118, ¹ 330, ¹ 358.1)	
(±0.05%)(¹³⁵)	
Wt. % A	<i>d</i> ₄ ¹⁶
0.00	0.7941
8.23	0.8560
9.14	0.8633
(±0.05%)(⁹⁶)	
Wt. % A	<i>d</i> ₄ ²⁵
0.00	0.7886
0.87	0.7942
2.98	0.8086
6.58	0.8354
9.01	0.8541
12.17	0.8808
B = CH ₅ N	
Methylamine	
(±0.25%)(⁸³)	
Wt. % A	<i>d</i> ₄ ⁰
23.26	0.866
13.70	0.786
9.61	0.753
6.79	0.733
3.44	0.710
1.87	0.699
1.27	0.694
0.99	0.693
0.53	0.693
0.36	0.691
0.12	0.677
0.07	0.688
0.04	0.687
B = C ₂ H ₅ N	
Acetonitrile (330) ¹	
B = C ₂ H ₆ O	
Ethyl alcohol (118, ¹ 303, 330 ¹)	
(±0.0075%)(²⁶⁴)	

Wt. % A	<i>d</i> ₄ ^{14.4}
0.000	0.79524
0.209	0.79671
0.417	0.79814
0.831	0.80095
1.649	0.80644
(±0.05%)(⁹⁶)	
Wt. % A	<i>d</i> ₄ ²⁵
0.00	0.7870
0.27	0.7890
0.53	0.7906
0.75	0.7929
1.06	0.7937
1.38	0.7960
B = C ₂ H ₆ O ₂	
Ethylene glycol (330) ¹	
(±0.05%)(⁹⁶)	
Wt. % A	<i>d</i> ₄ ²⁵
0.00	1.1096
4.07	1.1410
8.43	1.1780
12.73	1.2138
15.97	1.2431
B = C ₃ H ₅ N	
Propionitrile (330) ¹	
B = C ₃ H ₆ O	
Acetone (330) ¹	
(±0.0075%)(²⁶⁴)	
Wt. % A	<i>d</i> ₄ ^{14.6}
0.000	0.79757
0.215	0.79929
0.431	0.80096
0.854	0.80416
(±0.05%)(⁹⁶)	
Wt. % A	<i>d</i> ₄ ²⁵
0.00	0.7878
0.55	0.7924
0.74	0.7942
1.10	0.7965
1.47	0.7988
B = C ₃ H ₈ O	
Propyl alcohol (118) ^{1,2}	
B = C ₃ H ₈ O ₃	
Glycerol	
(±0.05%)(⁹⁶)	
Wt. % A	<i>d</i> ₄ ²⁵
0.00	1.2472
4.58	1.2824
7.19	1.3056
8.94	1.3164
13.75	1.3644
B = C ₄ H ₅ NO ₂	
Methyl cyanoacetate (330) ¹	
B = C ₅ H ₄ O ₂	
Furfural (330) ¹	
(to 4.173 Wt. % A)(⁹⁶)	
<i>d</i> ₄ ²⁵ = (1.1537 + 0.00915 × Wt. % A) ± 0.05%	
B = C ₅ H ₅ N	
Pyridine	
(±0.05%)(⁹⁶)	

Wt. % A	<i>d</i> ₄ ²⁵
0.00	0.9716
0.06	0.9729
0.12	0.9735
B = C ₅ H ₇ NO ₂	
Ethyl cyanoacetate (330) ¹	
B = C ₇ H ₅ N	
Benzonitrile (330) ¹	
B = C ₇ H ₆ O	
Benzaldehyde (330) ^{1,2}	
B = C ₇ H ₆ O ₂	
Salicylaldehyde (330) ¹	
B = C ₈ H ₈ O	
Acetophenone	
(to 1.0 Wt. % A)(¹⁸⁸)	
<i>d</i> ₄ ²⁵ = (1.02382 + 0.871 × Wt. % A) ± 0.1%	
B = C ₈ H ₈ O ₂	
Anisaldehyde (330) ¹	
KNO₃	
B = CH ₃ NO	
Formamide	
(±0.05%)(³⁶⁰)	
Wt. % A	<i>d</i> ₄ ²⁵
2.186	1.1570
0.884	1.1444
0.000	1.1359
KCHO₂ , Formate	
B = CH ₂ O ₂	
Formic acid	
(±0.1%)(²⁷⁶)	
<i>d</i> ₄ ²⁵ = 1.2142 + 0.045c	
c = Mole A per l soln.	
KC₂H₃O₂ , Acetate	
B = C ₂ H ₆ O	
Ethyl alcohol (40, 296, ^{1,2} 303)	
KC₄H₅O₆	
Acid tartrate	
B = C ₂ H ₆ O	
Ethyl alcohol (296) ^{1,2}	
KC₁₈H₃₃O₂ , Oleate	
B = C ₂ H ₆ O	
Ethyl alcohol (57)	
K₃C₆H₅O₇·4H₂O	
Citrate tetrahydrate	
B = C ₂ H ₆ O	
Ethyl alcohol (296) ^{1,2}	
RbClO₄	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	
B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	
B = C ₃ H ₈ O	
Acetone (338) ^{1,2}	
B = C ₃ H ₈ O	
<i>n</i> -Propyl alcohol (338) ^{1,2}	

B = C ₄ H ₃ O ₂	
Ethyl acetate (338) ^{1,2}	
B = C ₄ H ₁₀ O	
<i>n</i> -Butyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	
RbCHO₂ , Formate	
B = CH ₂ O ₂	
Formic acid	
(±0.25%)(²⁷⁵)	
<i>d</i> ₄ ¹⁸ = 1.2233 + 0.080c	
<i>d</i> ₄ ²⁵ = 1.2142 + 0.085c	
c = Mole A per l soln.	
B = CH ₃ NO	
Formamide	
(±0.05%)(³⁶⁰)	
Wt. % A	<i>d</i> ₄ ²⁵
2.849	1.1462
1.149	1.1370
0.000	1.1313
CsClO₄	
B = CH ₄ O	
Methyl alcohol (338) ^{1,2}	
B = C ₂ H ₆ O	
Ethyl alcohol (338) ^{1,2}	
B = C ₃ H ₈ O	
Acetone (338) ^{1,2}	
B = C ₃ H ₈ O	
<i>n</i> -Propyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
<i>n</i> -Butyl alcohol (338) ^{1,2}	
B = C ₄ H ₁₀ O	
Isobutyl alcohol (338) ^{1,2}	
2. Three-Component Systems	
NH₄Cl	
B = CH ₄ O	
Methyl alcohol	
C = C ₂ H ₆ O	
Ethyl alcohol (118) ¹	
B = C ₂ H ₆ O	
Ethyl alcohol	
C = C ₃ H ₈ O	
Propyl alcohol (118) ¹	
NH₄Br	
B = CH ₄ O	
Methyl alcohol	
C = C ₂ H ₆ O	
Ethyl alcohol (118) ¹	
B = CH ₄ O	
Methyl alcohol	
C = C ₃ H ₈ O	
Propyl alcohol (118) ¹	
B = C ₂ H ₆ O	
Ethyl alcohol	
C = C ₃ H ₈ O	
Propyl alcohol (118) ¹	

HgCl_2 $\text{B} = \text{CH}_4\text{O}$ $\text{C} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol (117) ¹
$\text{B} = \text{CH}_4\text{O}$ $\text{C} = \text{C}_3\text{H}_8\text{O}$ Propyl alcohol (118) ¹
$\text{B} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol $\text{C} = \text{C}_3\text{H}_8\text{O}$ Propyl alcohol (118) ¹
HgBr_2 $\text{B} = \text{CH}_4\text{O}$ Methyl alcohol $\text{C} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol (117) ¹
$\text{B} = \text{CH}_4\text{O}$ $\text{C} = \text{C}_3\text{H}_8\text{O}$ Propyl alcohol (118) ¹
$\text{B} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol $\text{C} = \text{C}_3\text{H}_8\text{O}$ Propyl alcohol (118) ¹
HgI_2 $\text{B} = \text{CH}_4\text{O}$ $\text{C} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol (117) ¹
$\text{B} = \text{CH}_4\text{O}$ $\text{C} = \text{C}_3\text{H}_8\text{O}$ Propyl alcohol (118) ¹
$\text{B} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol $\text{C} = \text{C}_3\text{H}_8\text{O}$ Propyl alcohol (118) ¹
$\text{Hg}(\text{CN})_2$ $\text{B} = \text{CH}_4\text{O}$ $\text{C} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol (117) ¹
$\text{B} = \text{CH}_4\text{O}$ $\text{C} = \text{C}_3\text{H}_8\text{O}$ Propyl alcohol (118) ¹
$\text{B} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol $\text{C} = \text{C}_3\text{H}_8\text{O}$ Propyl alcohol (118) ¹
CuCl_2 $\text{B} = \text{C}_2\text{H}_6\text{O}$ Ethyl alcohol $\text{C} = \text{C}_7\text{H}_8$ Toluene (44) ¹
AgNO_3 $\text{B} = \text{C}_2\text{H}_3\text{N}$ Acetonitrile $\text{C} = \text{C}_5\text{H}_5\text{N}$ Pyridine (268) ¹

$B = C_5H_5N$ Pyridine $C = C_6H_7N$ Aniline (267) ¹
$Ca(NO_3)_2$ $B = CH_3NO$ Formamide $C = C_2H_6O$ Ethyl alcohol (360) ¹
$B = CH_4O$ $C = C_3H_6O$ Acetone (144, 359) ¹
$B = C_2H_6O$ Ethyl alcohol $C = C_3H_6O$ Acetone (144, 359) ¹
$LiNO_3$ $B = CH_3NO$ Formamide $C = C_2H_6O$ Ethyl alcohol (360) ¹
$NaBr$ $B = CH_4O$ $C = C_2H_6O$ Ethyl alcohol (118) ¹
$B = CH_4O$ $C = C_3H_8O$ Propyl alcohol (118) ¹
$B = C_2H_6O$ Ethyl alcohol $C = C_3H_8O$ Propyl alcohol (118) ¹
NaI $B = CH_4O$ $C = C_2H_6O$ Ethyl alcohol (113) ¹
$B = CH_4O$ $C = C_3H_8O$ Propyl alcohol (118) ¹
$B = C_2H_6O$ Ethyl alcohol $C = C_3H_8O$ Propyl alcohol (118) ¹
KI $B = CH_4O$ Methyl alcohol $C = C_2H_6O$ Ethyl alcohol (118) ¹
$B = CH_4O$ $C = C_3H_8O$ Propyl alcohol (118) ¹
$B = C_2H_6O$ Ethyl alcohol $C = C_3H_8O$ Propyl alcohol (118) ¹
RbI_2 $B = CH_3NO$ Formamide $C = C_2H_6O$ Ethyl alcohol (360) ¹

SEC. IV. ALL COMPONENTS ARE CHEMICAL COMPOUNDS
HAVING KEY FORMULAE BEGINNING WITH 16

The systems throughout this section are numbered serially and follow the **C**-arrangement. To find any given substance look for it among the **A**-components. The data for all systems containing this substance will be found there **given** or there cross-referenced by serial number.

Two-Component Systems

CCl₄		(0-100 Wt. % B)	
1. B = CS ₂ (61)		$d_4^{25} = (1.5829 + 0.046 \times \text{Wt. \% B}) \pm 0.075\%$	
(±0.025 %)(³¹)		7. B = C ₂ H ₄ Br ₂	
Mol % B	d_4^{20}	Ethylene bromide (14, 61)	
(0-100 Wt. % B)		$d_4^{25} = (0.6300 - 0.001704 \times \text{Wt. \% B}) \pm 0.025\%$ (285)	
		8. B = C ₂ H ₄ O ₂	
		Acetic acid (14)	
		9. B = C ₂ H ₆ O	
		Ethyl alcohol (35, 81, ¹ 128, ¹ 153.1)	
		(±0.025 %)(⁵¹ , 164)	
Wt. % B	d_4^{25}	Wt. % A	$d_4^{19.4}$
100.000	1.26322	94.61	1.5114
90.158	1.31000	90.87	1.4591
80.523	1.35148	85.61	1.3919
70.320	1.39033	78.69	1.3118
60.021	1.42792	72.58	1.2485
50.019	1.46095	70.26	1.2324
40.834	1.48898	55.34	1.1073
30.217	1.51898	49.00	1.0576
19.766	1.54671	40.37	1.0043
11.527	1.56715	30.17	0.9328
0.000	1.59372	20.36	0.8816
(±0.0075 %)(¹⁷¹)		9.88	0.8327
Wt. % B	d_4^{25}	4.84	0.8110
100.000	1.25684	10. B = C ₃ H ₆ O, Acetone	
71.725	1.33103	(±0.1 %)(²⁷⁰)	
42.845	1.41973	Mol % B	d_4^0
14.285	1.52371	0.00	1.632
0.000	1.58452	11.40	1.568
2. B = CHCl ₃ (14, 61)		36.44	1.380
(±0.025 %)(²³)		51.18	1.273
Wt. % A	d_4^{20}	73.55	1.087
100.000	1.5937	86.53	0.954
70.979	1.5642	96.67	0.852
46.097	1.5382	100.00	0.812
19.761	1.5093	11. B = C ₃ H ₆ O ₂	
0.000	1.4867	Methyl acetate (133)	
(±0.0075 %)(¹⁷¹)		12. B = C ₄ H ₆ O ₆	
Wt. % A	d_4^{25}	Tartaric acid (296) ²	
0.000	1.47577	13. B = C ₄ H ₈ O ₂	
19.269	1.49373	Ethyl acetate (351)	
57.277	1.53260	14. B = C ₄ H ₁₀ O, Ether (61)	
81.172	1.55963	15. B = C ₅ H ₅ N	
100.000	1.58300	Pyridine (14)	
(±0.05 %)(to 55°)(¹⁷⁸)		16. B = C ₆ H ₄ Br ₂	
50 Wt. % B		<i>p</i> -Dibromobenzene (158)	
a	10 ³ b	(±0.005 %)(³¹⁸)	
1.5707	1.059 <i>t</i>	Wt. % A	d_4^{25}
3. B = CH ₃ I (172) ¹		100.000	1.58426
4. B = CH ₄ O (350) ¹		97.452	1.59213
5. B = C ₂ Cl ₄		92.842	1.60694
(±0.075 %)(¹¹³ , 120)			
Wt. % A	d_4^{25}		
100.0	1.5829		
79.7	1.5868		
66.4	1.5894		
49.7	1.5940		
33.0	1.5981		
19.9	1.6003		
0.0	1.6074		
6. B = C ₂ H ₂ Cl ₄ (113, 120)			

CCl₄—(Continued)

17. B = C ₆ H ₄ Cl ₂	
Dichlorobenzene (172)	
(±0.075%)(15°–65°)	
a	10 ³ b
100.00 Wt. % A	
1.6039	1.928(<i>t</i> – 15)
93.62 Wt. % A	
1.5794	1.836(<i>t</i> – 15)

18. B = C ₆ H ₅ Br	
Bromobenzene (24)	
(±0.025%)(to 40°)	
a	10 ³ b
100.00 Wt. % B	
1.5223	1.348 <i>t</i>
70.462 Wt. % B	
1.5555	1.500 <i>t</i>
47.497 Wt. % B	
1.5810	1.628 <i>t</i>
21.826 Wt. % B	
1.6092	1.793 <i>t</i>
0.000 Wt. % B	
1.6326	1.940 <i>t</i>
(±0.025%)(23)	

Wt. % B	<i>d</i> ₄ ²⁰
100.000	1.4960
73.012	1.5232
47.985	1.5481
24.028	1.5713
0.000	1.5937

19. B = C ₆ H ₅ Cl	
Chlorobenzene (23, ¹ 35, 351)	
(±0.025%)(to 40°) (24)	
a	10 ³ b
0.000 Wt. % A	
1.1279	1.078 <i>t</i>
25.598 Wt. % A	
1.2532	1.268 <i>t</i>
56.330 Wt. % A	
1.4074	1.528 <i>t</i>
75.761 Wt. % A	
1.5067	1.700 <i>t</i>
100.00 Wt. % A	
1.6326	1.940 <i>t</i>

20. B = C ₆ H ₆ (23, ¹ 31, ¹ 59, ¹ 66, ¹ 81, ¹ 99, 122, ¹ 133, 158, 171, ¹ 178, ¹ 251, ¹ 280, ¹ 309, ¹ 351, 352 ¹)	
(±0.005%)(134)	
Wt. % B	<i>d</i> ₄ ²⁵
100.000	0.87372
83.127	0.94523
68.046	1.01993
56.581	1.08485
44.505	1.16321
35.296	1.23075
28.958	1.28261
20.329	1.35940
12.361	1.43947
6.496	1.50491
0.000	1.58456

(±0.005%)(134)	
Wt. % B	<i>d</i> ₄ ⁵⁰
100.000	0.84680
83.127	0.91599
68.046	0.98816
56.581	1.05097
44.505	1.12677
35.296	1.19217
28.958	1.24236
20.329	1.31678
12.361	1.39445
6.496	1.45796
0.000	1.53534
(±0.025%)(to 40°) (24)	
a	10 ³ b
0.000 Wt. % B	
1.63262	1.941 <i>t</i>
27.357 Wt. % B	
1.44442	1.733 <i>t</i>
52.362 Wt. % B	
1.26473	1.521 <i>t</i>
74.444 Wt. % B	
1.07636	1.287 <i>t</i>
100.00 Wt. % B	
0.89993	1.066 <i>t</i>

21. B = C ₆ H ₇ N	
Aniline	
(±0.05%)(107)	
Wt. % B	<i>d</i> ₄ ²⁵
100.00	1.0175
84.54	1.0786
70.40	1.1409
58.97	1.1964
48.13	1.2540
37.92	1.3127
28.83	1.3696
20.94	1.4228
12.95	1.4806
6.49	1.5307
1.86	1.5685
0.61	1.5794
0.00	1.5847

22. B = C ₇ H ₆ O ₂	
Benzoic acid (296) ²	

23. B = C ₇ H ₆ O ₃	
Salicylic acid (296) ²	

24. B = C ₇ H ₈ (31, ¹ 133, 171, ¹ 351)	
(±0.025%)(285)	
Wt. % A	<i>d</i> ₄ ²⁵
0	1.1593
10	1.1043
20	1.0530
30	1.0000
40	0.9463
50	0.8932
60	0.8420
70	0.7873
80	0.7349
90	0.6820
100	0.6300

25. B = C ₇ H ₁₆ O	
Ethyl amyl ether (61)	

26. B = C ₈ H ₁₀	
<i>m</i> -Xylene (61)	

27. B = C ₈ H ₁₄ O ₆	
Ethyl tartrate (228)	
(±0.05%)	
a	10 ³ b
(19.35°–58.2°) 100.00 Wt. % A	
1.5949	1.959(<i>t</i> – 19.35)
(18.91°–29.60°)	
91.18 Wt. % A	
1.5499	1.844(<i>t</i> – 18.91)
(18.1°–29.54°)	
79.78 Wt. % A	
1.4929	1.687(<i>t</i> – 18.1)
(20.08°–32.76°)	
51.07 Wt. % A	
1.3756	1.397(<i>t</i> – 20.08)

28. B = C ₁₀ H ₈	
Naphthalene	
(±0.075%)(172)	
Wt. % A	<i>d</i> ₄ ¹⁵
100.00	1.6043
96.31	1.5741
92.49	1.5421
92.34	1.5425
86.94	1.5006
(to 1.636 Wt. % B)	
<i>d</i> ₄ ¹⁸ = (1.59605 –	
0.008375 × Wt. % B)	
±0.0075% (54)	

29. B = C ₁₀ H ₁₆ O	
Camphor	
(±0.1%)(175)	
Wt. % B	<i>d</i> ₄ ²⁰
0	1.5930
10	1.5295
20	1.4664
30	1.4033
40	1.3398
50	1.3082

30. B = C ₁₄ H ₁₀	
Phenanthrene (158, 318)	
a	10 ³ b
±0.1% (15°–70°)	
0.000 Wt. % A	
1.6023	2.130(<i>t</i> – 15)
(±0.01%)(15°–70°)	
97.207 Wt. % A	
1.5858	1.880(<i>t</i> – 15)
95.625 Wt. % A	
1.5755	1.008(<i>t</i> – 15)

31. B = C ₁₈ H ₃₆ O ₂	
Stearic acid (296) ²	
<i>v. also</i> 1266	

CS ₂	
32. B = CHCl ₃ (35, 59, ¹ 61, 67, ¹ 103, 122, ¹ 240, 251 ¹)	
(±0.1%)(320)	
Wt. % A	<i>d</i> ₄ ¹⁵
0	1.491
10	1.461
20	1.434
30	1.410
40	1.387
50	1.364
60	1.344

Wt. % A	<i>d</i> ₄ ¹⁵
70	1.324
80	1.306
90	1.289
100	1.271

(±0.0075%)(171)	
Wt. % A	<i>d</i> ₄ ²⁵
100.000	1.25559
71.301	1.30461
34.440	1.37471
20.637	1.41663
6.090	1.45698
0.000	1.47579

(±0.05%)(290)	
Wt. % A	<i>d</i> ₄ ³⁵
100.00	1.2392
80.85	1.2704
65.19	1.2989
49.38	1.3316
41.06	1.3463
24.24	1.3856
0.00	1.4509

33. B = CH ₂ I ₂	
Methylene iodide (353)	

34. B = CH ₃ I	
(±0.1%)(309)	
Wt. % A	<i>d</i> ₄ ⁰
0.00	2.333
21.60	1.984
38.81	1.772
48.11	1.678
68.81	1.498
82.39	1.399
100.00	1.292

35. B = C ₂ H ₄ Br ₂	
Ethylene bromide (61)	

36. B = C ₂ H ₄ Cl ₂	
Ethylene chloride (59) ¹	

37. B = C ₂ H ₄ O ₂	
Acetic acid	
(±0.05%)(291)	
a	10 ³ b
(12.5°–30.4°)	
100.0 Wt. % B	
1.0581	1.128(<i>t</i> – 12.5)
(13.0°–30.1°)	
80.298 Wt. % B	
1.0780	1.269(<i>t</i> – 13.0)
(14.7°–30.7°)	
61.284 Wt. % B	
1.1055	1.375(<i>t</i> – 14.7)
(13.5°–30.8°)	
12.076 Wt. % B	
1.2281	1.486(<i>t</i> – 13.5)
(13.45°–33.95°)	
0.000 Wt. % B	
1.2731	1.497(<i>t</i> – 13.45)

38. B = C ₂ H ₄ O ₂	
Methyl formate (142)	

39. B = C ₂ H ₅ I	
Ethyl iodide (142)	

40. B = C ₂ H ₅ NO ₃	
Ethyl nitrate (236, ¹ 289 ¹)	

41. B = C₂H₆O
Ethyl alcohol (35, 37, 103, 124,¹
130,¹ 169, 240, 249,¹ 289,¹ 346,¹
353¹)

(±0.1%)(17.86°–35.96°) (67)

a	10 ³ b
100.000 Wt. % A	
1.2657	1.497(t – 17.86)
89.97 Wt. % A	
1.1897	1.465(t – 17.86)
79.86 Wt. % A	
1.1238	1.388(t – 17.86)
70.34 Wt. % A	
1.0687	1.304(t – 17.86)
59.40 Wt. % A	
1.0121	1.228(t – 17.86)
50.19 Wt. % A	
0.9693	1.160(t – 17.86)
39.93 Wt. % A	
0.9263	1.089(t – 17.86)
28.91 Wt. % A	
0.8853	1.022(t – 17.86)
20.02 Wt. % A	
0.8552	0.973(t – 17.86)
11.58 Wt. % A	
0.8290	0.917(t – 17.86)
0.00 Wt. % A	
0.7960	0.857(t – 17.86)

42. B = C₃H₆O
Acetone (79, 99, 133, 351)
(±0.005%)(134, 289)

Wt. % B	d ₄ ²⁵
100.000	0.78799
86.755	0.82402
70.674	0.87475
59.671	0.91488
48.239	0.96189
48.201	0.96212
48.098	0.96296
35.267	1.02360
28.863	1.05768
16.717	1.13113
13.108	1.15539
1.000	1.25595
Wt. % B	d ₄ ^{35.17}
100.000	0.77626
86.755	0.81166
70.674	0.86177
59.671	0.90132
48.239	0.94785
48.201	0.94806
48.098	0.94887
35.267	1.00902
28.863	1.04311
16.717	1.11601
13.108	1.14011
1.000	1.24054

43. B = C₃H₈O
n-Propyl alcohol
(±0.05%)(130)

Wt. % A	d ₄ ^{15.5}
100.00	1.2693
90.93	1.2028
78.32	1.1229
61.43	1.0333

Wt. % A	d ₄ ^{15.5}
40.81	0.9428
18.76	0.8637
0.00	0.8074

44. B = C₃H₈O₂
Methylal (133, 351)
(±0.005%)(134, 289)

Wt. % A	d ₄ ²⁵
0.000	0.85313
12.921	0.88549
28.682	0.93050
38.408	0.96201
43.598	0.98009
45.630	0.98723
53.139	1.01566
60.034	1.04363
62.226	1.05309
62.380	1.05362
65.262	1.06613
75.141	1.11246
86.449	1.17221
100.000	1.25595
Wt. % A	d ₄ ^{35.17}
0.000	0.84003
12.921	0.87195
28.682	0.91652
38.408	0.94787
43.598	0.96583
45.630	0.97270
53.139	1.00095
60.034	1.02835
62.226	1.03822
62.380	1.03880
65.262	1.05137
75.141	1.09721
86.449	1.15683
100.000	1.24054

45. B = C₄H₈O₂
Isobutyric acid
(±0.05%)(291)

a	10 ³ b
(13.45°–33.95°)	
100.00 Wt. % A	
1.2731	1.498(t – 13.45)
(13.35°–30.1°)	
79.66 Wt. % A	
1.1833	1.409(t – 13.35)
(12.4°–31.0°)	
54.72 Wt. % A	
1.0961	1.280(t – 12.4)
(13.1°–28.2°)	
31.97 Wt. % A	
1.0314	1.152(t – 13.1)
(11.4°–74.4°)	
0.00 Wt. % A	
0.9621	1.017(t – 11.4)

46. B = C₄H₈O₂
Ethyl acetate (142, 158)
(±0.0075%)(171)

Wt. % A	d ₄ ²⁵
100.000	1.25590
88.647	1.16620
60.764	1.06578
33.596	0.97396
0.000	0.88896

47. B = C₄H₁₀O
Isobutyl alcohol
(±0.05%)(291)

a	10 ³ b
(16.25°–74.65°)	
100.00 Wt. % B	
0.8070	0.8300(t – 16.25)
(13.8°–32.4°)	
70.39 Wt. % B	
0.9013	0.9575(t – 13.8)
(15.5°–30.7°)	
50.22 Wt. % B	
0.9792	1.0980(t – 15.5)
(13.9°–34.2°)	
30.01 Wt. % B	
1.0769	1.2070(t – 13.9)
(11.3°–31.7°)	
15.80 Wt. % B	
1.1628	1.3000(t – 11.3)
(13.45°–33.95°)	
0.00 Wt. % B	
1.2731	1.4990(t – 13.45)

48. B = C₄H₁₀O
Ethyl ether (59,¹ 61, 103, 158,
290¹)

Wt. % A	d ₄ ²⁵
100.000	1.25559
86.908	1.13931
65.656	0.99091
37.258	0.84461
0.000	0.70769

49. B = C₅H₁₀
Amylene (103)

50. B = C₅H₁₀O₂
Isovaleric acid
(±0.05%)(291)

a	10 ³ b
(13.45°–33.95°)	
100.00 Wt. % A	
1.2731	1.498(t – 13.45)
(12.15°–30.7°)	
71.70 Wt. % A	
1.1471	1.321(t – 12.15)
(14.2°–31.2°)	
54.10 Wt. % A	
1.0809	1.212(t – 14.2)
(10.2°–30.7°)	
37.43 Wt. % A	
1.0328	1.063(t – 10.2)
(17.6°–60.8°)	
0.00 Wt. % A	
0.9333	0.951(t – 17.6)

51. B = C₆H₄Br₂
p-Dibromobenzene (158)
(±0.005%)(318)

Wt. % A	d ₄ ²⁵
100.000	1.25568
96.173	1.27299
91.993	1.29256
90.020	1.30149

52. B = C₆H₅Br
Bromobenzene (59,¹ 61)

53. B = C₆H₅Cl
Chlorobenzene (59)¹

54. B = C₆H₅NO₂
Nitrobenzene (142)

55. B = C₆H₆ (59,¹ 99, 103,
133, 142, 158)
(±0.025%)(30)

Wt. % B	d ₄ ^{19.8}
100.000	0.8788
87.361	0.9088
75.066	0.9458
60.569	0.9918
59.027	0.9970
49.599	1.0295
38.968	1.0707
34.602	1.0894
27.526	1.1205
20.187	1.1550
17.193	1.1698
5.325	1.2325
0.000	1.2642
Wt. % B	d ₄ ²⁵
0.000	1.25230
8.868	1.20550
34.847	1.08172
75.878	0.93900
100.000	0.87406

56. B = C₆H₇N
Aniline (142)

57. B = C₆H₁₀O₃
Ethyl acetoacetate (142)

58. B = C₆H₁₂O₂
d-β-Butyl acetate
(±0.1%)(242)

Wt. % A	d ₄ ¹⁷
92.44	1.2264
78.60	1.1502
70.13	1.1078
49.85	1.0283
33.55	0.9717

59. B = C₆H₁₂O₃
Paraldehyde (142)

60. B = C₇H₅NS
Phenyl thiocyanate (353)

61. B = C₇H₆O
Benzaldehyde (142)

62. B = C₇H₆O₂
Benzoic acid (296)²

63. B = C₇H₆O₃
Salicylic acid (296)²

64. B = C₇H₇NO₂
o-Nitrotoluene (136)¹

65. B = C₇H₇NO₂
p-Nitrotoluene
(±0.1%)(136)

Wt. % A	d ₄ ²⁰
100.0	1.265
88.6	1.248
79.1	1.236
61.6	1.215
50.7	1.203
47.0	1.198

CS₂.—(Continued)66. B = C₇H₈ (61, 99, 133, 158)
(±0.0075%)(171)

Wt. % A	d_4^{25}
100.000	1.25559
92.734	1.21400
62.018	1.06441
36.768	0.96939
0.000	0.86053

67. B = C₇H₈O₆Gallic acid monohydrate (296)²68. B = C₇H₁₆

Heptane (61)

69. B = C₉H₈O

Cinnamic aldehyde (289, 353)

70. B = C₁₀H₇Br

Bromonaphthalene (353)

71. B = C₁₀H₈

Naphthalene (54, 1303)

(±0.005%)(85)

Wt. % A	d_4^{18}
100.000	1.26643
95.036	1.25182
90.082	1.23768
86.149	1.22676
80.163	1.21052
74.915	1.19661
70.240	1.18452

72. B = C₁₀H₁₂O

Anethole (289, 353)

73. B = C₁₀H₁₆O

Camphor

(±0.1%)(277)

Wt. % B	d_4^{20}
0.00	1.263
3.54	1.249
8.70	1.227
18.46	1.191
24.12	1.170
37.80	1.126
65.20	1.046

74. B = C₁₀H₁₆O₄Camphoric acid (296)²75. B = C₁₀H₂₀O₂*d*-β-Octyl acetate

(±0.1%)(242)

Wt. % A	d_4^{17}
95.44	1.2144
84.63	1.1766
67.93	1.0965
55.67	1.0393
52.10	1.0255
39.15	0.9810
27.51	0.9411

76. B = C₁₂H₁₀

Diphenyl (158)

(±0.005%)(318)

Wt. % A	d_4^{25}
100.000	1.25568
96.193	1.24510
88.297	1.22320

77. B = C₁₂H₁₀N₂

Azobenzene (158)

(±0.005%)(318)

Wt. % B	d_4^{25}
0.000	1.25568
1.024	1.25371
6.253	1.24262
14.121	1.22641

78. B = C₁₈H₃₆O₂Stearic acid (296)²

78.5 B = Turpentine

(±0.025%)(123)

Wt. % A	d_4^{15}
0.000	0.86193
20.332	0.91810
40.485	0.98596
60.116	1.05748
78.750	1.14811
100.000	1.27006

v. also 1CHBr₃

Bromoform

79. B = CHI₃

Iodoform (20, 254)

80. B = CH₂I₂

Methylene iodide (260)

81. B = CH₄O

Methyl alcohol

(±0.1%)(200)

Wt. % B	d_4^{20}
74.72	0.983
85.72	0.886
92.42	0.834
100.00	0.796

82. B = C₂H₆O

Ethyl alcohol

(±0.1%)(200)

Wt. % B	d_4^{20}
100.00	0.790
92.43	0.833
85.82	0.891
74.20	0.979

83. B = C₃H₆OAcetone (200)¹84. B = C₃H₈OPropyl alcohol (200)¹85. B = C₄H₁₀OEthyl ether (200)¹

(±0.05%)(64)

Wt. % B	d_4^{25}
100.000	0.708
78.172	0.852
54.652	1.092
42.728	1.268
31.079	1.504
25.151	1.659
21.640	1.766
19.959	1.820
14.747	2.060
8.494	2.314
3.248	2.635
0.000	2.878

86. B = C₅H₁₂OIsoamyl alcohol (200)¹87. B = C₆H₅NO₂

Nitrobenzene

(±0.075%)(68, 150)

Wt. % B	d_4^{10}
0.00	2.8887
9.68	2.4724
25.85	2.0809
50.08	1.6833
65.83	1.4987
88.39	1.2955
100.00	1.2125

Wt. % B	$d_4^{16.5}$
0.00	2.7167
9.68	2.3338
25.85	1.9599
50.08	1.5871
65.83	1.4135
88.39	1.2246
100.00	1.1167

88. B = C₆H₆ (200)¹89. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(228)

a | 10^{3b}

(19.07°–25.75°)

0.00 Wt. % B

2.8901 | 2.601(*t* – 19.07)

(19.04°–30.03°)

7.08 Wt. % B

2.6181 | 2.365(*t* – 19.04)

(12.9°–73.0°)

10.00 Wt. % B

2.5151 | 2.311(*t* – 12.9)

(19.25°–32.17°)

30.92 Wt. % B

2.0029 | 1.803(*t* – 19.25)*v. also* 1267, 1268CHCl₃

Chloroform

90. B = CH₄O (44)¹

Methyl alcohol

91. B = C₂H₃Cl₃O₂Chloral hydrate (299)^{1,2}92. B = C₂H₄Br₂

Ethylene bromide (61)

(±0.1%)(251)

(10.2°–131.3°)

50 Wt. % B

a | 10^{3b}1.606 | 1.551(*t* – 10.2)93. B = C₂H₄O₂

Acetic acid (14)

94. B = C₂H₆OEthyl alcohol (35, 81, 103, 169, 240, 326)¹

(±0.05%)(67, 290)

(19.46°–30.96°)

a | 10^{3b}

100.00 Wt. % A

1.4875 | 1.845(*t* – 19.46)

89.65 Wt. % A

1.3636 | 1.730(*t* – 19.46)

80.06 Wt. % A

1.2671 | 1.548(*t* – 19.46)*a* | 10^{3b}

69.96 Wt. % A

1.1798 | 1.418(*t* – 19.46)

59.93 Wt. % A

1.1048 | 1.340(*t* – 19.46)

50.03 Wt. % A

1.0384 | 1.218(*t* – 19.46)

40.04 Wt. % A

0.9789 | 1.105(*t* – 19.46)

30.00 Wt. % A

0.9255 | 1.043(*t* – 19.46)

20.03 Wt. % A

0.8777 | 0.973(*t* – 19.46)

9.97 Wt. % A

0.8340 | 0.913(*t* – 19.46)

0.00 Wt. % A

0.7947 | 0.858(*t* – 19.46)95. B = C₃H₈O

Acetone (59, 162, 179, 81, 199, 131, 133, 290, 1351)

(±0.005%)(134)

Wt. % B	d_4^{25}
0.000	0.78492
16.664	0.85146
33.039	0.92905
45.832	1.00050
56.298	1.06789
64.507	1.12763
72.276	1.19082
79.884	1.25927
88.409	1.34501
94.292	1.41066
100.000	1.47993

Wt. % B	$d_4^{35.17}$
0.000	0.77322
16.664	0.83892
33.039	0.91568
45.832	0.98641
56.298	1.05311
64.507	1.11211
72.276	1.17478
79.884	1.24250
88.409	1.32718
94.292	1.39204
100.000	1.46045

(±0.25%)(0°–40°)(312)

a | 10^{3b}

100.00 Mol % B

0.814 | 1.050*t*

84.3 Mol % B

0.932 | 1.300*t*

63.8 Mol % B

1.076 | 1.375*t*

51.7 Mol % B

1.161 | 1.450*t*

39.1 Mol % B

1.253 | 1.675*t*

17.6 Mol % B

1.392 | 1.350*t*

0.0 Mol % B

1.514 | 1.900*t*96. B = C₃H₇NO

Propionamide (180)

97. B = C₃H₇NO₂Urethane (299)^{1,2}

98. B = C₄H₁₀O
Ethyl ether (59,¹ 61, 94, 103,
176, 309,¹ 315)
(±0.05%)(63, 280)

Mol % A	d_4^{25}
100	1.5159
80	1.3150
60	1.1647
40	1.0176
20	0.8548
0	0.7290

Mol % A	d_4^{20}
17.3	0.8219
25.6	0.8801
36.6	0.9585
45.7	1.0268
52.0	1.0746
53.5	1.0863
55.3	1.0994
66.3	1.1869
68.2	1.2012
79.8	1.2968

Mol % A	d_4^{25}
0.00	0.7082
7.46	0.7562
10.06	0.7732
10.46	0.7757
11.95	0.7871
14.37	0.8026
26.49	0.8848
26.90	0.8879
27.92	0.8951
32.02	0.9254
40.21	0.9849
42.57	1.0023
45.04	1.0210
46.96	1.0359
56.23	1.1060
60.92	1.1441
61.14	1.1460
64.60	1.1736
68.40	1.2039
68.76	1.2059
77.08	1.2766
84.23	1.3365
84.95	1.3433
88.41	1.3723
89.63	1.3837
95.52	1.4366
100.00	1.4785

Mol % A	d_4^{30}
5.4	0.7439
12.3	0.7896
15.2	0.8076
20.5	0.8441
25.0	0.8741
29.1	0.9021
33.6	0.9366
39.6	0.9806
44.3	1.0153
49.5	1.0550
59.2	1.1297
68.9	1.2079
72.8	1.2400
89.6	1.3834

99. B = C₄H₁₂ClN
Diethylammonium chloride
(333)¹

100. B = C₄H₁₂N₂O₃
Diethylammonium nitrate
(333)¹

101. B = C₅H₁₀
Amylene (61, 103)

102. B = C₅H₁₂
Pentane (61)

103. B = C₅H₁₂O
n-Amyl alcohol
(±0.01%)(131)

Wt. % B	d_4^{25}
0.000	1.4800
11.090	1.3541
19.471	1.2718
26.778	1.2096
42.037	1.0712
59.865	0.9886
69.308	0.9388
100.000	0.8068

104. B = C₆H₄Br₂
p-Dibromobenzene (158)
(to 9.069% B)(318)
 $d_4^{25} = (1.47737 + 0.003825 \times$
Wt. % B) ± 0.005%

105. B = C₆H₄N₂O₄
m-Dinitrobenzene (158)
(±0.01%)(318)

Wt. % A	d_4^{15}
100.000	1.4963
97.121	1.4977
93.443	1.4975
Wt. % A	d_4^{20}
100.00	1.4868
97.121	1.4879
93.443	1.4885
Wt. % A	d_4^{30}
100.000	1.4680
97.121	1.4693
93.443	1.4704
Wt. % A	d_4^{40}
100.000	1.4489
97.121	1.4503
93.443	1.4522
Wt. % A	d_4^{50}
100.000	1.4296
97.121	1.4318
93.443	1.4339
Wt. % A	d_4^{60}
100.000	1.4100
97.121	1.4134
93.443	1.4162

106. B = C₆H₅Br
Bromobenzene
(0–100 Mol % B)
 $d_4^0 = (1.526 - 0.04 \times$
Mol % B) ± 0.1% (269)

107. B = C₆H₅NO₂
o-Nitrophenol
(±0.075%)(15°–55°)(172)

a | 10³b
100.00 Wt. % A
1.4898 | 1.838(*t* – 15)
91.72 Wt. % A
1.4774 | 1.758(*t* – 15)
108. B = C₆H₆ (35, 61, 99, 103,
158, 171)¹

(±0.05%)(280, 282)

Mol % B	d_4^{25}
0.0	1.5159
20.0	1.3761
40.0	1.2449
60.0	1.1142
80.0	0.9500
100.0	0.8907

Mol % B	d_4^{20}
0.0	1.4754
20.0	1.3450
40.0	1.2210
60.0	1.0972
80.0	0.9823
100.0	0.8787

Mol % B | d_4^{25}
0.0 | 1.4671
20.0 | 1.3350
40.0 | 1.2103
60.0 | 1.0834
80.0 | 0.9716
100.0 | 0.8750
(±0.025%)(to 70°)(178)
50 Wt. % B

a | 10³b
1.1282 | 1.347*t*

109. B = C₆H₆O
Phenol
(±0.005%)(319)

Wt. % A	$d_4^{12.87}$
100.000	1.50180
96.127	1.48012
93.066	1.46362
87.997	1.43697
77.971	1.38685

110. B = C₆H₁₀O₈
Citric acid monohydrate (296)²

111. B = C₆H₁₆ClN
Triethylammonium chloride
(333)¹

112. B = C₇H₅N₃O₆
Trinitrotoluene
(±0.005%)(319)

Wt. % A	$d_4^{12.87}$
100.000	1.50180
98.398	1.50340
97.445	1.50448
96.897	1.50480

113. B = C₇H₅O₂
Benzoic acid (296)¹
(±0.005%)(319)

Wt. % A	$d_4^{12.87}$
100.000	1.50180
98.469	1.49564
96.470	1.48750
91.569	1.46832

114. B = C₇H₅O₃
Salicylic acid (296)²

115. B = C₇H₈ (35, 172)¹

116. B = C₇H₉N
p-Toluidine (299)^{1,2}

117. B = C₇H₁₆
Heptane (61)

118. B = C₇H₁₆O
Ethyl amyl ether (61)

119. B = C₈H₈O
Acetophenone
(±0.1%)(270)

Mol % A	d_4^{25}
100.00	1.475
66.30	1.285
49.90	1.215
28.75	1.125
11.25	1.062
0.00	1.025

120. B = C₈H₉NO
Acetanilide (299)^{1,2}

121. B = C₈H₁₀O
Phenetole
(±0.1%)(269)

Mol % A	d_4^{25}
100.00	1.5261
90.91	1.4472
67.62	1.2858
51.82	1.2113
19.91	1.0531
0.00	0.9841

122. B = C₈H₁₂O₆
Dimethyl acetylmaleate
(±0.05%)(227)

a | 10³b
(10.44°–29.2°)
95.96 Wt. % A
1.4940 | 1.892(*t* – 10.44)
(14.3°–28.5°)
90.45 Wt. % A
1.4662 | 1.782(*t* – 14.3)

123. B = C₈H₁₄O₆
Ethyl tartrate (343,¹ 344)¹
(±0.05%)(207, 217)

a | 10³b
(12.8°–51.0°)
98.00 Wt. % A
1.4931 | 1.882(*t* – 12.8)
(18.0°–54.0°)
91.01 Wt. % A
1.4588 | 1.775(*t* – 18.0)
(17.3°–60.0°)
80.88 Wt. % A
1.4267 | 1.661(*t* – 17.3)
(14.5°–59.3°)
60.09 Wt. % A
1.3668 | 1.427(*t* – 14.5)
(13.5°–57.3°)
39.96 Wt. % A
1.3110 | 1.248(*t* – 13.5)
(11.3°–52.3°)
30.05 Wt. % A
1.2616 | 1.108(*t* – 11.3)

CHCl₃.—(Continued)	
124. B = C ₈ H ₂₀ BrN Tetraethylammonium bromide (±0.05%)(334)	
Wt. % A	d_4^{25}
100.00	1.4761
93.88	1.4692
92.52	1.4682
Wt. % A	d_4^{50}
100.00	1.4268
93.88	1.4275
92.52	1.4262
125. B = C ₈ H ₂₀ ClN Tetraethylammonium chloride (333) ¹	
126. B = C ₉ H ₁₁ NO Methylacetanilide (180)	
127. B = C ₁₀ H ₄ Cl ₄ Naphthalene tetrachloride (148) ¹	
128. B = C ₁₀ H ₈ Naphthalene (299) ¹ (±0.005%)(85)	
Wt. % A	d_4^{18}
100.000	1.47921
95.237	1.45038
89.857	1.41826
84.213	1.38632
80.885	1.36810
74.987	1.33716
68.966	1.30650
129. B = C ₁₀ H ₁₄ Durene (±0.005%)(318)	
Wt. % A	d_4^{25}
100.000	1.47737
98.055	1.45696
95.351	1.42978
89.859	1.37821
85.759	1.34476
130. B = C ₁₀ H ₁₄ N ₂ Nicotine (343) ¹	
131. B = C ₁₀ H ₁₆ O Camphor (±0.05%)(343)	
Wt. % B	d_4^{20}
0.00	1.4749
1.15	1.4664
2.19	1.4586
4.03	1.4452
5.31	1.4361
35.27	1.2476
132. B = C ₁₀ H ₁₆ O ₄ Camphoric acid (296) ²	
133. B = C ₁₀ H ₂₄ ClN Diamylammonium chloride (333) ¹	
134. B = C ₁₂ H ₁₀ Acenaphthene (158, 2991) (±0.005%)(318)	

Wt. % A	d_4^{25}
100.000	1.47737
98.508	1.46921
96.033	1.45677
92.624	1.43966
86.801	1.41004
135. B = C ₁₂ H ₁₀ Diphenyl (158) (±0.005%)(318)	
Wt. % A	d_4^{25}
100.000	1.47737
98.373	1.46776
95.809	1.45224
94.683	1.44500
89.721	1.41573
86.855	1.39880
136. B = C ₁₂ H ₁₀ N ₂ Azobenzene (±0.005%)(318)	
Wt. % B	d_4^{25}
0.000	1.47737
3.116	1.46158
7.482	1.43984
10.829	1.42258
(10 Wt. % B)(±0.25%)(158)	
t	d_4^t
20	1.425
30	1.405
50	1.363
60	1.335
137. B = C ₁₂ H ₁₀ O Diphenyl ether (±0.1%)(269)	
Mol % A	d_4^{25}
0.00	1.072
31.36	1.150
56.96	1.239
81.70	1.357
100.00	1.526
138. B = C ₁₄ H ₈ O ₂ Anthraquinone (297, 1.2 317, 1.2)	
139. B = C ₁₄ H ₁₀ O ₂ Benzil (158) (±0.005%)(318)	
Wt. % A	d_4^{25}
100.000	1.47737
97.968	1.47020
96.177	1.46381
90.491	1.44321
84.679	1.42148
140. B = C ₁₈ H ₃₆ O ₂ Stearic acid (296) ²	
141. B = C ₁₉ H ₁₆ Triphenylmethane (158) (±0.005%)(318)	
Wt. % A	d_4^{25}
100.000	1.47737
97.325	1.46327
93.168	1.44148
92.979	1.44005
90.795	1.42863
142. B = C ₂₇ H ₄₆ O Cholesterol (148) ¹ <i>v. also</i> 2, 32	

CHI₃	
Iodoform <i>v.</i> 79, 1267, 1268, 1269, 1270	
CH₂Cl₂	
Methylene chloride 143. B = C ₃ H ₆ O Acetone (±0.1%)(270)	
Mol % B	d_4^0
0.00	1.378
12.76	1.281
42.35	1.107
60.46	1.009
81.12	0.905
92.27	0.850
100.00	0.812
144. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(228) <i>a</i> | 10 ^{3b} (18.05°–26.23°) 0.00 Wt. % B 1.3393 | 1.847(<i>t</i> – 18.05) (19.34°–25.96°) 5.12 Wt. % B 1.3283 | 1.784(<i>t</i> – 19.34) (18.57°–28.13°) 9.75 Wt. % B 1.3221 | 1.717(<i>t</i> – 18.57) (20.37°–27.20°) 17.10 Wt. % B 1.3079 | 1.625(<i>t</i> – 20.37) (19.50°–27.33°) 32.90 Wt. % B 1.2866 | 1.481(<i>t</i> – 19.50) (18.86°–26.45°) 61.88 Wt. % B 1.2485 | 1.238(<i>t</i> – 18.86)	
CH₂I₂	
Methylene iodide 145. B = C ₆ H ₆ (254)	
146. B = C ₆ H ₁₀ O ₄ Ethyl oxalate (236) ¹	
147. B = C ₈ H ₁₀ Xylene (254)	
148. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(228) <i>a</i> | 10 ^{3b} (19.41°–29.15°) 0.00 Wt. % B 3.3233 | 2.579(<i>t</i> – 19.41) (21.06°–33.48°) 1.42 Wt. % B 3.2338 | 2.625(<i>t</i> – 21.06) <i>v. also</i> 33, 80, 1269, 1270	
CH₂O₂	
Formic acid 149. B = CH ₃ NO Formamide	

(±0.075%)(183)	
Mol % A	d_4^{25}
0.00	1.1315
10.00	1.1442
19.99	1.1540
30.00	1.1639
39.99	1.1783
49.98	1.1828
60.00	1.1917
69.85	1.1993
79.95	1.2060
90.00	1.2109
100.00	1.2133
Mol % A	d_4^{40}
10.00	1.1310
19.99	1.1406
30.00	1.1500
39.99	1.1593
49.98	1.1676
60.00	1.1761
69.85	1.1828
79.95	1.1889
90.00	1.1931
100.00	1.1943
150. B = CH ₄ O Methyl alcohol (±0.1%)(108)	
Wt. % B	d_4^{18}
0.00	1.2190
33.13	1.0258
61.88	0.9233
75.70	0.8716
80.92	0.8544
90.19	0.8274
95.14	0.8109
100.00	0.7940
151. B = CH ₅ NO ₂ Ammonium formate (276) $d_4^{25} = (1.2142 + 0.001479$ $\times \text{g-Mole B per l soln.}) \pm 0.1\%$	
152. B = C ₂ H ₄ O ₂ Acetic acid (±0.05%)(157) $d_4^t =$ 100 Mol % B 1.0715(1 – 0.001026 <i>t</i>) 95 Mol % B 1.0806(1 – 0.001020 <i>t</i>) 75 Mol % B 1.1062(1 – 0.001040 <i>t</i>) 50 Mol % B 1.1434(1 – 0.001030 <i>t</i>) 25 Mol % B 1.1872(1 – 0.001002 <i>t</i>) 0 Mol % B 1.2450(1 – 0.00100 <i>t</i>)	
153. B = C ₂ H ₆ O Ethyl alcohol (168, 169)	
154. B = C ₇ H ₆ O Benzaldehyde (168, 169)	

155. B = C₇H₉NO₂
Phenylammonium formate
(±0.1%)(²⁷⁶)

Wt. % A	d_4^{25}
88.05	1.213
92.81	1.214
95.33	1.215
96.20	1.215
98.18	1.215
99.07	1.214
100.00	1.214

156. B = C₁₀H₁₆O
Camphor (³²³, ³⁴²)
(±0.1%)(¹⁰⁰)

Wt. % B	d_4^{20}
0.00	1.2201
8.44	1.1881
12.27	1.1579
26.56	1.1313
36.31	1.1026
46.54	1.0746

CH₃I

Methyl iodide

157. B = C₂H₅I

Ethyl iodide (²⁵⁴)

(±0.05%)(¹⁶⁶)

Wt. % B	d_4^{15}
100	1.9433
90	1.9713
80	2.0003
70	2.0301
60	2.0607
50	2.0923
40	2.1250
30	2.1585
20	2.1933
10	2.2292
0	2.2661

158. B = C₂H₆O

Ethyl alcohol

(±0.01%)(¹³²)

Wt. % B	d_4^{25}
0.000	2.25095
1.956	2.16755
4.916	2.09160
7.710	1.95955
14.648	1.74860
20.965	1.60897
25.418	1.51855
39.971	1.28333
100.000	0.78662

159. B = C₃H₆O

Acetone

(±0.01%)(¹³²)

Wt. % B	d_4^{25}
0.000	2.2509
2.590	2.1438
4.780	2.0603
9.376	1.9050
17.084	1.6936
24.015	1.5410
28.378	1.4336
45.640	1.2059
100.000	0.7853

160. B = C₃H₈O

n-Propyl alcohol

(±0.01%)(¹³²)

Wt. % B	d_4^{25}
0.000	2.25095
2.572	2.14550
4.680	2.06785
4.890	2.06047
9.642	1.90575
19.616	1.69215
24.116	1.54487
29.800	1.45180
45.120	1.23140
100.000	0.79972

161. B = C₄H₈O₂

Ethyl acetate

(±0.01%)(¹³²)

Wt. % B	d_4^{25}
0.000	2.25095
3.768	2.11280
7.456	2.00230
12.906	1.85980
15.552	1.73610
23.708	1.63240
37.268	1.41803
100.000	0.89088

162. B = C₆H₆ (¹⁷²)¹

163. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(²²⁸)

a | 10³b

(18.22°–26.35°)

0.00 Wt. % B

2.2825 | 2.891 (*t* – 18.22)

(19.39°–26.62°)

5.20 Wt. % B

2.1703 | 2.681 (*t* – 19.39)

(18.86°–23.16°)

10.45 Wt. % B

2.0744 | 2.512 (*t* – 18.86)

(18.77°–25.12°)

38.09 Wt. % B

1.6884 | 1.811 (*t* – 18.77)

v. also 3, 34, 1271, 1272

CH₃NO

Formamide

164. B = CH₄O

Methyl alcohol

(±0.075%)(¹⁸³)

Mol % B	d_4^{25}
0.00	1.1312
9.87	1.1252
19.96	1.1186
30.80	1.1112
40.03	1.1032
50.03	1.0939
60.11	1.0825
69.97	1.0686
80.02	1.0511
89.99	1.0276

Mol % B

d_4^{40}

9.87	1.0906
19.96	1.0605
30.80	1.0302
40.03	0.9978
50.03	0.9638
60.11	0.9285
69.97	0.8940
80.02	0.8562
89.99	0.8172
100.00	0.7749

164.5 B = CH₅NO₂

Ammonium formate

(±0.05%)(³⁶⁰)

Wt. % B	d_4^{25}
1.393	1.1324
0.558	1.1310
0.000	1.1303

165. B = C₂H₄O₂

Acetic acid

(±0.075%)(¹⁸³)

Mol % B	d_4^{25}
0.00	1.1318
9.62	1.1284
20.39	1.1198
29.74	1.1146
40.56	1.1122
49.82	1.1015
59.89	1.0938
69.42	1.0847
78.95	1.0755
90.10	1.0621
100.00	1.0463

Mol % B	d_4^{40}
9.62	1.1151
20.39	1.1063
29.74	1.1011
40.56	1.0983
49.82	1.0873
59.89	1.0791
69.42	1.0687
78.95	1.0600
90.10	1.0462
100.00	1.0294

166. B = C₂H₆O

Ethyl alcohol

(±0.075%)(¹⁸³, ³⁶⁰)

Mol % B	d_4^{25}
0.00	1.1314
10.00	1.0846
18.92	1.0457
29.76	1.0042
39.07	0.9678
50.09	0.9335
59.29	0.9022
69.86	0.8701
80.09	0.8401
89.95	0.8126
100.00	0.7857

Wt. % B	d_4^{30}
100.000	0.78078
98.188	0.78560
94.225	0.79628
84.329	0.82371

(±0.01%)(³³)

(±0.075%)(¹⁸³)

Mol % B	d_4^{40}
0.00	1.1190
10.00	1.0722
18.92	1.0332
29.76	0.9927
39.07	0.9573
50.09	0.9209
59.29	0.8896
69.86	0.8571
80.09	0.8271
89.95	0.7997
100.00	0.7727

167. B = C₃H₅O₂

Propionic acid

(±0.075%)(¹⁸³)

Mol % A	d_4^{25}
100.00	1.1327
97.60	1.1297
91.01	1.1250
81.15	1.1185
73.38	1.1083
59.87	1.0852
49.76	1.0699
39.79	1.0549
29.92	1.0391
19.49	1.0222
10.02	1.0059
0.00	0.9885

Mol % A	d_4^{40}
91.01	1.1130
81.15	1.1056
73.38	1.0954
59.87	1.0711
49.76	1.0566
39.79	1.0408
29.92	1.0248
19.49	1.0074
10.02	0.9906
0.00	0.9725

168. B = C₃H₈O

n-Propyl alcohol

(±0.1%)(⁷⁸)

Wt. % B	d_4^{25}
0.00	1.1314
11.23	1.0850
20.67	1.0472
29.94	1.0114
39.96	0.9753
49.99	0.9411

169. B = C₄H₈O₂

Butyric acid

(±0.075%)(¹⁸³)

Mol % B	d_4^{25}
0.00	1.1320
4.90	1.1169
14.30	1.1100
20.10	1.0952
29.89	1.0711
40.04	1.0505
49.73	1.0324
59.69	1.0151
69.87	0.9988
79.56	0.9825
89.57	0.9677
100.00	0.9528

CH₃NO.—(Continued)B = C₄H₈O₂.—(Continued)

Mol % B	d_4^{40}
4.90	1.1044
14.30	1.0975
20.10	1.0826
29.89	1.0584
40.04	1.0375
49.73	1.0191
59.69	1.0019
69.87	0.9849
79.56	0.9684
89.57	0.9536
100.00	0.9380

170. B = C₄H₁₀O

Isobutyl alcohol

(±0.1%)(78)

Wt. % B	d_4^{25}
0.00	1.1307
10.09	1.0854
19.95	1.0475
30.00	1.0091
39.81	0.9745
49.98	0.9398

171. B = C₅H₅N

Pyridine

(±0.05%)(70)

Wt. % B	d_4^{25}
100.00	0.9746
92.23	0.9871
88.90	0.9935
82.88	1.0070

172. B = C₅H₁₂O

Isoamyl alcohol

(±0.075%)(68, 150)

Wt. % B	d_4^0
100.00	0.8253
97.18	0.8315
90.01	0.8497
69.92	0.9041
49.84	0.9649
30.14	1.0335
10.38	1.1111
0.00	1.1549

(±0.1%)(78)

Wt. % B	d_4^{25}
0.00	1.1314
10.01	1.0870
19.94	1.0485
29.98	1.0115
39.95	0.9756
50.01	0.9413
60.00	0.9108

(±0.075%)(68, 150)

Wt. % B	$d_4^{6.5}$
100.00	0.7656
97.18	0.7731
90.01	0.7908
69.92	0.8440
49.84	0.9044
30.14	0.9726
10.38	1.0479
0.00	1.0901

173. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(343)

Wt. % B	d_4^{20}
74.671	1.1986
51.103	1.1806
25.687	1.1577
8.860	1.1425
5.345	1.1396
1.899	1.1365

174. B = C₁₀H₁₄N₂

Nicotine

(±0.05%)(343)

Wt. % A	d_4^{20}
0.00	1.0100
38.46	1.0610
61.67	1.0889
82.20	1.1139
88.68	1.2203

*v. also 149***CH₃NO₂**

Nitromethane

175. B = C₂H₆OEthyl alcohol (192, 1 328¹)176. B = C₄H₁₂IN

Tetramethylammonium

iodide (330)¹177. B = C₈H₂₀IN

Tetraethylammonium iodide

(330, 1 331¹)178. B = C₁₂H₂₈IN

Tetrapropylammonium iodide

(330)¹**CH₄N₂O**

Urea

179. B = CH₄OMethyl alcohol (299)¹180. B = CH₅N

Methylamine

(±0.25%)(83)

Wt. % B	d_4^0
74.19	0.773
86.11	0.755
92.26	0.724
96.75	0.704
98.24	0.694
98.81	0.693
99.25	0.691
99.49	0.689
99.71	0.689
99.90	0.690
99.94	0.692
99.98	0.685

181. B = C₂H₆OEthyl alcohol (299)^{1,2}

(±0.01%)(33)

Wt. % B	d_4^{25}
100.000	0.78521
97.580	0.79419
97.249	0.79542
96.599	0.79795
94.848	0.80456

Wt. % B

 d_4^{30}

100.000	0.78078
97.685	0.78939
95.853	0.79628

(±0.025%)(247)

Mol % B	d_4^{40}
100.00	0.77329
88.46	0.77865
76.88	0.78553
65.71	0.79176
54.47	0.79746

Mol % B	d_4^{50}
100.00	0.76329
88.42	0.77143
77.00	0.77722
65.37	0.78304
54.38	0.78845

Mol % B	d_4^{60}
100.00	0.75435
88.59	0.76261
77.12	0.76841
65.59	0.77417
54.45	0.77926

Mol % B	d_4^{70}
100.00	0.74650
88.39	0.75220
77.00	0.75780
65.42	0.76360
54.27	0.76878

183. B = C₅H₅NPyridine (70)¹**CH₄N₂S**

Thiourea

184. B = CH₄N₂S

Ammonium thiocyanate (8)

185. B = C₅H₅N

Pyridine

(±0.05%)(70)

Wt. % B	d_4^{25}
100.00	0.9746
94.48	0.9949
87.43	1.0190

CH₄N₂S

Ammonium thiocyanate

*v. 184***CH₄O**

Methyl alcohol

186. B = C₂H₃N

Methyl cyanide

(±0.5%)(322)

Wt. % A	d_4^0
0	0.8052
10	0.8063
20	0.8073
30	0.8083
40	0.8093
50	0.8102
60	0.8110
70	0.8115
80	0.8115
90	0.8109
100	0.8098

187. B = C₂H₄O₂

Acetic acid (168)

(±0.1%)(108)

Wt. % B	d_4^{18}
100.00	1.057
50.50	0.916
33.55	0.878
20.27	0.842
6.44	0.809
0.00	0.794

187.5. B = C₂H₅I

Ethyl iodide

(±0.1%)(362)

Wt. % A	d_4^{20}
0.0	1.9340
26.8	1.3480
68.7	0.9656
100.0	0.7932

188. B = C₂H₅OEthyl alcohol (133, 351); *cf.*

(358.5)

(0–100 Wt. % A)

 $d_4^{15} = (0.79367 + 0.04235 \times$

Wt. % A) ±0.025% (65)

(0–100 Wt. % A)

 $d_4^{25} = (0.7867 + 0.0413 \times$

Wt. % A) ±0.1% (113, 117)

189. B = C₃H₆OAcetone (144)¹

(±0.1%)(359)

Vol. % B	d_4^0
0	0.8110
25	0.8160
50	0.8180
75	0.8170
100	0.8132

(±0.025%)(65)

Wt. % B	d_4^{15}
0.00	0.7960
8.00	0.7976
31.63	0.8005
50.29	0.8015
76.03	0.8007
88.05	0.7992
100.00	0.7900

(±0.1%)(359)

Vol. % B	d_4^{25}
0	0.7875
25	0.7896
50	0.7916
75	0.7896
100	0.7856

190. B = C₃H₇NO₂Urethane (299)¹191. B = C₃H₈O*n*-Propyl alcohol

(±0.025%)(65)

Wt. % A	d_4^{18}
100.00	0.79602
95.63	0.79651
90.12	0.79692
79.72	0.79788
65.37	0.79936
59.10	0.80005

Wt. % A	d_4^{15}	Wt. % A	d_4^{20}	(0-100 Mol % A)(⁸²) $d_4^{25} = (0.8722 - 0.03836 \times \text{Mol \% A}) \pm 0.1\%$	a | 10 ³ b (20.2°-46.7°) 5.00 Wt. % B 0.8070 | 0.955(<i>t</i> - 20.2) (22°-45.8°) 10.00 Wt. % B 0.8212 | 0.967(<i>t</i> - 22) (14.1°-43.2°) 25.01 Wt. % B 0.8800 | 0.976(<i>t</i> - 14.1) (19.8°-51°) 50.00 Wt. % B 0.9707 | 1.000(<i>t</i> - 19.8) (18.3°-53.2°) 75.00 Wt. % B 1.0841 | 1.015(<i>t</i> - 18.3) (16.8°-99.4°) 100.00 Wt. % B 1.2085 | 1.016(<i>t</i> - 16.8)
49.71	0.80104	84.17	0.8942	204. B = C ₆ H ₇ N Aniline (0-100 Wt. % A)(^{107, 132}) $d_4^{25} = (1.0175 - 0.002298 \times \text{Wt. \% A}) \pm 0.025\%$	210. B = C ₃ H ₂₀ IN Tetraethylammonium iodide (330) ¹
40.38	0.80215	75.00	0.9452		211. B = C ₉ H ₆ O ₂ Phenylpropionic acid ($\pm 0.05\%$)(¹²⁵)
31.88	0.80325	47.58	1.0860		Wt. % A | d_4^{25} 100.00 | 0.7880 94.79 | 0.8049 89.65 | 0.8194
21.05	0.80466	197. B = C ₄ H ₈ O ₂ Butyric acid ($\pm 0.1\%$)(¹⁰⁸)		205. B = C ₇ H ₈ O Anisole (¹⁰) ($\pm 0.025\%$)(⁹)	212. B = C ₉ H ₈ O ₂ Cinnamic acid (to 11.06 Wt. % B)(¹²⁵) $d_4^{25} = (0.7880 + 0.003075 \times \text{Wt. \% B}) \pm 0.05\%$
11.97	0.80582	Wt. % A | d_4^{18} 0.00 | 0.9607 56.34 | 0.8610 76.73 | 0.8334 88.12 | 0.8148 100.00 | 0.7940	198. B = C ₄ H ₁₀ O Isobutyl alcohol ($\pm 0.025\%$)(⁶⁵)	206. B = C ₈ H ₉ NO Acetanilide (²⁹⁹) ¹	213. B = C ₉ H ₁₀ O Cinnamyl alcohol (¹⁴⁸) ¹
0.00	0.80753 ($\pm 0.075\%$)(^{113, 118})	Wt. % B | d_4^{15} 0.00 | 0.79602 5.34 | 0.79631 14.19 | 0.79679 19.72 | 0.79709 22.54 | 0.79731 39.47 | 0.79854 49.41 | 0.79943 70.93 | 0.80177 89.84 | 0.80423 100.00 | 0.80567		207. B = C ₈ H ₁₀ O Phenetole ($\pm 0.025\%$)(⁹)	214. B = C ₉ H ₁₀ O ₂ β -Phenylpropionic acid (to 9.32 Wt. % B)(¹²⁵) $d_4^{25} = (0.7880 + 0.002825 \times \text{Wt. \% B}) \pm 0.05\%$
Wt. % A | d_4^{25} 100.00 | 0.7878 88.89 | 0.7894 76.20 | 0.7907 34.80 | 0.7954 8.20 | 0.7992 6.25 | 0.7995 3.40 | 0.7999 0.00 | 0.8004	199. B = C ₄ H ₁₀ O Ethyl ether (^{10, 41}) ($\pm 0.025\%$)(⁹)		208. B = C ₈ H ₁₂ O ₆ Dimethyl acetylmalate ($\pm 0.05\%$)(²²⁷)	215. B = C ₁₀ H ₈ Naphthalene (^{148, 1299}) ¹ ($\pm 0.0075\%$)(⁵⁴)	
$d_4^t =$ ($\pm 0.05\%$)(¹⁵⁷) 100 Mol % A 0.8105(1 - 0.001135 <i>t</i>) 75 Mol % A 0.8137(1 - 0.001083 <i>t</i>) 50 Mol % A 0.8162(1 - 0.001030 <i>t</i>) 25 Mol % A 0.8197(1 - 0.001054 <i>t</i>) 0 Mol % A 0.8210(1 - 0.001024 <i>t</i>)	Wt. % B | d_4^{25} 0.00 | 0.7882 23.12 | 0.7733 35.07 | 0.7650 47.40 | 0.7561 60.23 | 0.7461 73.08 | 0.7353 86.33 | 0.7230 100.00 | 0.7079		a | 10 ³ b (15.4°-29.5°) 96.04 Wt. % A 0.8079 | 0.9575(<i>t</i> - 15.4) (16.6°-29.3°) 89.66 Wt. % A 0.8257 | 0.9340(<i>t</i> - 16.6)	Wt. % A | d_4^{18} 100.000 | 0.79511 98.436 | 0.79914 96.131 | 0.80299	216. B = C ₁₀ H ₈ O α -Naphthol (¹⁴⁸) ¹
192. B = C ₃ H ₈ O ₃ Glycerol ($\pm 0.25\%$)(³⁸)	200. B = C ₄ H ₁₂ IN Tetramethylammonium iodide (330) ¹		209. B = C ₈ H ₁₄ O ₆ Ethyl tartrate ($\pm 0.05\%$)(^{170, 343})	217. B = C ₁₀ H ₈ O β -Naphthol (¹⁴⁸) ¹	
Wt. % A | d_4^{56} 0.00 | 1.2400 2.96 | 1.2227 9.72 | 1.1853 16.76 | 1.1399 23.89 | 1.1006 31.02 | 1.0620 34.99 | 1.0418 50.61 | 0.9642 56.22 | 0.9386 66.17 | 0.8942 90.40 | 0.7963 100.00 | 0.7604	201. B = C ₆ H ₁₂ O Amyl alcohol (^{168, 169})		Wt. % B | d_4^{20} 100.00 | 1.2044 77.46 | 1.0882 56.65 | 1.0007 39.92 | 0.9381 26.97 | 0.8946 15.31 | 0.8568 12.01 | 0.8324 5.13 | 0.8102 0.00 | 0.7938 ($\pm 0.05\%$)(^{203, 288, 344})	218. B = C ₁₀ H ₁₂ Tetrahydronaphthalene (to 50.6 Wt. % B)(¹²¹) $d_4^{25} = (0.7869 + 0.00157 \times \text{Wt. \% B}) \pm 0.075\%$	
193. B = C ₄ H ₂ O ₄ Acetylene dicarboxylic acid (0-100 Wt. % B)(¹²⁵) $d_4^{25} = (0.7880 + 0.00419 \times \text{Wt. \% B}) \pm 0.05\%$	202. B = C ₆ H ₅ NO ₂ Nitrobenzene ($\pm 0.1\%$)(⁸²)		a | 10 ³ b (16°-48°) 0.00 Wt. % B 0.7955 | 0.959(<i>t</i> - 16)	219. B = C ₁₀ H ₁₄ N ₂ Nicotine (⁹³) ¹ (0-100 Wt. % B)(³⁴³) $d_4^{20} = (0.7938 + 0.002162 \times \text{Wt. \% B}) \pm 0.05\%$	
194. B = C ₄ H ₄ O ₄ Fumaric acid (to 8.15 Wt. % B)(¹²⁵) $d_4^{25} = (0.7880 + 0.00403 \times \text{Wt. \% B}) \pm 0.05\%$	Wt. % A | d_4^{25} 100 | 0.7860 75 | 0.8945 50 | 0.9984 25 | 1.1010 0 | 1.1980				
195. B = C ₄ H ₆ O ₄ Succinic acid (to 10.08 Wt. % B)(¹²⁵) $d_4^{25} = (0.7880 + 0.00407 \times \text{Wt. \% B}) \pm 0.05\%$	203. B = C ₆ H ₆ (^{81, 133, 139, 233, 1238, 1351}) ($\pm 0.005\%$)(³¹⁹)				
196. B = C ₄ H ₆ O ₅ Malic acid ($\pm 0.075\%$)(¹⁹⁴)	Wt. % B | $d_4^{12.87}$ 100.000 | 0.88619 98.135 | 0.88437 92.693 | 0.87914 85.930 | 0.87280 80.370 | 0.86766 78.573 | 0.86605 61.666 | 0.85073				

CH₄O.—(Continued)

220. B = C ₁₀ H ₁₄ O Thymol (354)	
221. B = C ₁₀ H ₁₅ BrO Bromocamphor (148) ¹	
222. B = C ₁₀ H ₁₆ O Camphor (148, ¹ 170, 175, 323, 342, 354) (±0.1%)(¹⁰⁰)	
Wt. % B	<i>d</i> ₄ ²⁰
0.00	0.7912
12.34	0.8102
24.14	0.8286
35.46	0.8472
46.26	0.8649
56.66	0.8827
223. B = C ₁₀ H ₁₈ O <i>l</i> -Borneol (53, 148) ¹	
224. B = C ₁₀ H ₂₂ O ₃ Terpine hydrate (148) ¹	
225. B = C ₁₂ H ₁₀ Acenaphthene (299) ¹	
226. B = C ₁₂ H ₂₈ IN Tetrapropylammonium iodide (330) ¹	
227. B = C ₁₈ H ₃₄ O ₂ Oleic acid (57)	
<i>v. also</i> 4, 81, 90, 150, 164, 179, 1265	

CH₅N

Methylamine	
228. B = C ₆ H ₅ N ₃ O ₄ 2, 4-Dinitroaniline (±0.25%)(⁸³)	
Wt. % B	<i>d</i> ₄ ⁰
15.67	0.776
12.24	0.763
8.82	0.737
6.09	0.719
4.16	0.709
2.25	0.701
1.52	0.691
0.81	0.689
0.55	0.687
0.20	0.686
0.07	0.685
229. B = C ₇ H ₉ NO ₃ S <i>m</i> -Methoxybenzenesul- fonamide (±0.25%)(⁸³)	
Wt. % B	<i>d</i> ₄ ⁰
52.83	1.103
33.98	0.917
24.82	0.845
23.73	0.829
13.73	0.767
9.61	0.738
7.18	0.728
3.94	0.709
2.68	0.700
1.36	0.694
0.73	0.693
0.49	0.691

v. also 180**CH₅NO₂**

Ammonium formate <i>v.</i> 151, 164.5	
C ₂ Cl ₄ Tetrachloroethylene	
230. B = C ₈ H ₈ O Acetophenone (±0.1%)(²⁷⁰)	
Mol % B	<i>d</i> ₄ ²⁵
0.00	1.612
12.55	1.528
32.15	1.407
53.97	1.275
73.29	1.168
91.42	1.071
100.00	1.025

v. also 5**C₂HCl₃**

Trichloroethylene	
231. B = C ₂ HCl ₅ Pentachloroethane (±0.075%)(¹¹³ , ¹²⁰)	
Wt. % B	<i>d</i> ₄ ²⁵
100.0	1.6712
82.1	1.6242
69.6	1.5967
53.5	1.5631
36.5	1.5290
22.3	1.5031
0.0	1.4540

C₂HCl₃O

Chloral	
232. B = C ₂ H ₆ O Ethyl alcohol (±0.05%)(¹⁶²)	
Wt. % B	<i>d</i> ₄ ⁴⁰
100.00	0.7732
73.76	0.9234
63.84	0.9862
55.54	1.0225
48.37	1.1165
42.15	1.1754
31.90	1.2826
29.71	1.3083
27.63	1.3303
25.66	1.3525
24.53	1.3632
23.80	1.3703
20.35	1.3927
17.24	1.4093
11.80	1.4364
9.52	1.4490
7.24	1.4633
3.36	1.4868
0.00	1.4911
Wt. % B	<i>d</i> ₄ ¹⁵
100.00	0.7690
73.76	0.9135
63.84	0.9803
55.54	1.0471
48.37	1.1117

Wt. % B

42.15	<i>d</i> ₄ ⁴⁵
31.90	1.1693
29.71	1.2760
27.63	1.3000
25.66	1.3221
24.53	1.3441
23.80	1.3556
20.35	1.3620
17.24	1.3857
11.80	1.4026
9.52	1.4288
7.24	1.4421
3.36	1.4550
0.00	1.4783
Wt. % B	<i>d</i> ₄ ⁵⁰
100.00	1.4812
73.76	0.7644
63.84	0.9086
55.54	0.9725
48.37	1.0417
42.15	1.1025
31.90	1.1632
29.71	1.2696
27.63	1.2908
25.66	1.3140
24.53	1.3334
23.80	1.3460
20.35	1.3537
17.24	1.3771
11.80	1.3915
9.52	1.4212
7.24	1.4348
3.36	1.4468
0.00	1.4682
Wt. % B	<i>d</i> ₄ ⁶⁰
100.00	1.4724
73.76	0.7552
63.84	0.8989
55.54	0.9628
48.37	1.0310
42.15	1.0970
31.90	1.1515
29.71	1.2561
27.63	1.2787
25.66	1.3018
24.53	1.3205
23.80	1.3321
20.35	1.3380
17.24	1.3606
11.80	1.3782
9.52	1.4063
7.24	1.4196
3.36	1.4303
0.00	1.4511
Wt. % B	<i>d</i> ₄ ⁷⁰
100.00	1.4540
73.76	0.7462
63.84	0.8901
55.54	0.9530
48.37	1.0200
42.15	1.0811
31.90	1.1396
29.71	1.2421
27.63	1.2667
25.66	1.2853
	1.3049

Wt. % B

24.53	<i>d</i> ₄ ⁷⁰
23.80	1.3150
20.35	1.3214
17.24	1.3418
11.80	1.3586
9.52	1.3902
7.24	1.4032
3.36	1.4135
0.00	1.4346
	1.4356
Wt. % B	<i>d</i> ₄ ⁸⁵
73.76	0.8769
63.84	0.9426
55.54	1.0035
48.37	1.0661
42.15	1.1216
31.90	1.2221
29.71	1.2434
27.63	1.2606
25.66	1.2803
24.53	1.2904
23.80	1.2965
20.35	1.3225
17.24	1.3403
11.80	1.3692
9.52	1.3822
7.24	1.3888
0.00	1.4068
233. B = C ₅ H ₁₂ O Dimethylethyl carbinol (±0.05%)(⁷⁵)	
Wt. % A	<i>d</i> ₄ ²⁵
0.00	0.8068
15.69	0.8879
29.51	0.9660
41.80	1.0506
52.76	1.1386
55.28	1.1676
57.81	1.1789
60.22	1.2000
62.62	1.2189
67.18	1.2572
71.51	1.2911
79.61	1.3569
83.31	1.3904
87.01	1.4225
93.77	1.4757
100.00	1.5043
Wt. % A	<i>d</i> ₄ ⁴⁰
0.00	0.7922
15.69	0.8719
29.51	0.9500
41.80	1.0352
52.76	1.1204
55.28	1.1373
57.81	1.1587
60.22	1.1746
62.62	1.1984
67.18	1.2349
71.51	1.2686
79.61	1.3359
83.31	1.3671
87.01	1.3997
93.77	1.4557
100.00	1.4911

Wt. % A	d_4^{50}
0.00	0.7823
15.69	0.8614
29.51	0.9390
41.80	1.0204
52.76	1.1018
55.28	1.1208
57.81	1.1421
60.22	1.1550
62.62	1.1822
67.18	1.2160
71.51	1.2506
79.61	1.3171
83.31	1.3471
87.01	1.3834
93.77	1.4362
100.00	1.4724
Wt. % A	d_4^{70}
0.00	0.7607
15.69	0.8377
29.51	0.9135
41.80	0.9931
52.76	1.0729
55.28	1.0907
57.81	1.1081
60.22	1.1262
62.62	1.1434
67.18	1.1794
71.51	1.2076
79.61	1.2783
83.31	1.3093
87.01	1.3427
93.77	1.4003
100.00	1.4356
Wt. % A	d_4^{85}
0.00	0.7445
15.69	0.8154
29.51	0.8939
41.80	0.9689
52.76	1.0449
55.28	1.0625
57.81	1.0793
60.22	1.0974
62.62	1.1138
67.18	1.1502
71.51	1.1786
87.01	1.3133
93.77	1.3748
100.00	1.4068

C₂HCl₃O₂

Trichloroacetic acid

234. B = C₂H₄O₂

Acetic acid

(±0.1%)(¹⁵¹)

Mol % B	d_4^{25}
100.00	1.050
92.63	1.129
82.23	1.223
67.91	1.337
56.52	1.409
47.38	1.457
41.47	1.491
34.19	1.508

235. B = C₃H₆O

Acetone

(±0.1%)(¹⁵¹)

Mol % B	d_4^{25}
100.00	0.787
95.16	0.854
86.84	0.934
74.57	1.073
61.74	1.209
49.52	1.319
40.29	1.400
28.25	1.483

236. B = C₄H₈O₂

Ethyl acetate

(±0.1%)(¹⁵¹)

Wt. % B	d_4^{25}
100.00	0.895
88.82	0.997
81.50	1.045
71.93	1.123
61.54	1.202
51.22	1.295
38.58	1.386
29.92	1.454

237. B = C₄H₁₀O

Ethyl ether

(±0.25%)(³¹⁶)

Wt. % B	d_4^{18}
100.00	0.717
82.37	0.812
68.82	0.899
57.24	0.893 <i>sic</i>
37.37	1.159
25.40	1.314

238. B = C₈H₈O

Acetophenone

(±0.1%)(¹⁵¹)

Mol % B	d_4^{25}
100.00	1.026
91.04	1.076
86.00	1.103
78.79	1.146
70.61	1.192
59.10	1.268
51.24	1.317
42.06	1.376
31.85	1.442

239. B = C₉H₁₀O₂

Ethyl benzoate

(±0.05%)(¹⁵¹)

Mol % B	d_4^{25}
100.00	1.0458
91.13	1.0864
79.04	1.1466
68.75	1.1915
60.18	1.2413
50.93	1.2922
42.05	1.3501
33.42	1.4027

C₂HCl₅

Pentachloroethane

240. B = C₃H₆O

Acetone

(±0.1%)(²⁷⁰)

Mol % B	d_4^{25}
0.00	1.672
14.76	1.594
31.78	1.487
51.03	1.340
70.37	1.157
90.68	0.918
100.00	0.787

241. B = C₄H₁₀O

Ethyl ether

(±0.1%)(²⁷⁰)

Mol % B	d_4^0
100.00	0.736
85.76	0.906
74.73	1.031
49.68	1.293
30.47	1.467
13.03	1.609
0.00	1.708

242. B = C₈H₈O

Acetophenone

(0-100 Mol % A)(²⁷⁰) $d_4^{25} = (1.0251 + 0.006471 \times \text{Mol \% A}) \pm 0.1\%$ 243. B = C₈H₁₀O

Phenetole

(±0.1%)(²⁷⁰)

Mol % A	d_4^{25}
100.00	1.672
90.29	1.603
77.86	1.508
51.05	1.317
32.02	1.176
9.70	1.027
0.00	0.961

244. B = C₁₂H₁₀O

Diphenyl ether

(±0.1%)(²⁷⁰)

Mol % B	d_4^{25}
0.00	1.672
26.42	1.481
51.09	1.330
76.11	1.189
100.00	1.072

v. also 231**C₂H₂Br₂**

Dibromoethylene

245. B = C₆H₆ (²⁵⁴)246. B = C₈H₁₀Xylene (²⁵⁴)**C₂H₂Br₄**

Acetylene tetrabromide

247. B = C₂H₂Cl₄Acetylene tetrachloride (³²⁴)248. B = C₂H₃Br₃

Vinyl tribromide

(±0.1%)(⁵)

Wt. % A	$d_4^{17.5}$
100.00	2.971
73.08	2.869
72.52	2.866
45.57	2.769
0.00	2.619

Wt. % A	$d_4^{21.5}$
100.00	2.963
73.08	2.860
72.52	2.860
45.57	2.762
0.00	2.611

249. B = C₈H₁₄O₆Ethyl tartrate (²²⁸)a | 10³b

(20.87°-31.5°)

0.00 Wt. % B

2.9595 | 2.240(*t* - 20.87)

(19.99°-45.91°)

5.67 Wt. % B

2.7260 | 2.100(*t* - 19.99)

(19.82°-30.2°)

9.96 Wt. % B

2.5740 | 2.003(*t* - 19.82)

(17.76°-25.98°)

20.11 Wt. % B

2.2804 | 1.839(*t* - 17.76)**C₂H₂Cl₂O₂**

Dichloroacetic acid

250. B = C₆H₆ (¹³⁵)¹251. B = C₇H₈Toluene (±0.05%)(¹³⁵)

Wt. % B	d_4^{16}
100.00	0.8694
92.41	0.8980
75.30	0.9761
0.00	1.5488

C₂H₂Cl₄

Tetrachloroethane

252. B = C₃H₆OAcetone (±0.1%)(²⁷⁰)

Mol % B	d_4^0
0.00	1.614
15.92	1.534
58.07	1.238
73.08	1.106
81.36	1.023
97.28	0.849
100.00	0.812

253. B = C₄H₈O₃

Methyl L-lactate

(±0.05%)(²¹¹)a | 10³b

(-75° to +125°)

100.00 Wt. % B

1.2040 | 1.158(*t* + 75)

(-7.8° to +120°)

9.94 Wt. % B

2.5806 | 2.084(*t* + 7.8)254. B = C₄H₁₀OEthyl ether (±0.1%)(²⁷⁰)

Mol % B	d_4^0
100.00	0.736
94.01	0.794
82.68	0.907
69.81	1.030
47.99	1.231
21.15	1.459
0.00	1.614

C₂H₂Cl₄—(Continued)

255. B = C₅H₁₀O₃
Methyl *l*-α-methoxypropionate (211)
(10.06 Wt. % B)(±0.05%)

<i>t</i>	<i>d</i> ₄ ^t
16.7	2.4842
39.8	2.4373
52.5	2.4118
77.0	2.3613
101.0	2.3124
119.0	2.2744
(-16.6° to +130.0°)	
100.0 Wt. % B	
<i>d</i> ₄ ^t = 1.0361 - 0.001143(<i>t</i> + 16.6)	

256. B = C₆H₅NO₂

Nitrobenzene

(±0.075%)(68, 150)

Wt. % B	<i>d</i> ₄ ⁵
0.00	1.6095
10.00	1.5567
30.05	1.4672
48.33	1.3915
69.26	1.3136
89.64	1.2475
100.00	1.2168
Wt. % B	<i>d</i> ₄ ^{76.5}
0.00	1.4991
10.00	1.4537
30.05	1.3746
48.33	1.3053
69.26	1.2369
100.00	1.1476

257. B = C₆H₁₀O₄

Methyl *l*-α-acetoxypionate (211)

(10.04 Wt. % B)(±0.05%)

<i>t</i>	<i>d</i> ₄ ^t
17.6	2.5244
39.8	2.4799
54.7	2.4502
76.4	2.4061
91.3	2.3755
119.0	2.3204
139.3	2.2689

(-7.4° to +141.0°)

100.0 Wt. % B

*d*₄^t = 1.1198 - 0.001144 (*t* + 7.4)

258. B = C₈H₈O

Acetophenone

(±0.075%)(68, 150)

Wt. % B	<i>d</i> ₄ ¹⁰
0.00	1.5995
10.19	1.5176
30.07	1.3751
50.00	1.2590
70.01	1.1595
90.00	1.0757
100.00	1.0358
Wt. % B	<i>d</i> ₄ ⁸⁰
0.00	1.4932
10.02	1.4160

Wt. % B	<i>d</i> ₄ ³⁰
31.20	1.2867
69.93	1.0892
89.74	1.0122
100.00	0.9758

259. B = C₈H₁₀O

Phenetole

(±0.1%)(270)

Wt. % B	<i>d</i> ₄ ⁰
0.00	1.614
21.76	1.465
51.67	1.266
62.80	1.194
78.37	1.101
100.00	0.984

260. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(228)

a | 10³b

(18.2°-29.27°)

0.00 Wt. % B

1.6023 | 1.555(*t* - 18.2)

(18.79°-27.44°)

4.96 Wt. % B

1.5744 | 1.514(*t* - 18.79)

(21.68°-71.2°)

9.31 Wt. % B

1.5478 | 1.488(*t* - 21.68)

(17.76°-28.27°)

38.06 Wt. % B

1.4226 | 1.293(*t* - 17.76)

261. B = C₁₀H₈

Naphthalene (48, 49)

(to 35.02 Wt. % B)

$\frac{1}{d_4^{30}} = (0.63269 + 0.003495 \times$

Wt. % B) ± 0.005%

262. B = C₁₂H₂₂O₆

Isobutyl tartrate

(±0.05%)(209)

a | 10³b

(0°-99.7°)

33.362 Wt. % B

1.4030 | 1.26*t*

(24.8°-99.65°)

48.150 Wt. % B

1.2923 | 1.153(*t* - 24.8)

263. B = C₁₆H₂₆O₈

Isobutyl diacetyl-*d*-tartrate

(±0.05%)(209)

a | 10³b

(16.03°-99.75°)

20.034 Wt. % B

1.4664 | 1.375(*t* - 16.03)

(-21° to +99.3°)

100.00 Wt. % B

1.1220 | 0.936(*t* + 21)

v. also 6, 247

C₂H₃Br₃

Vinyl tribromide, *v.* 248

C₂H₃ClO₂

Chloroacetic acid

264. B = C₆H₆ (135)¹

(±0.005%)(319)

Wt. % B	<i>d</i> ₄ ^{12.87}
100.000	0.88638
96.035	0.89915
91.596	0.91404
89.139	0.92255

265. B = C₇H₈ (135)¹

(±0.005%)(319)

Wt. % B	<i>d</i> ₄ ^{12.87}
100.000	0.87233
97.452	0.88082
91.868	0.90010
89.002	0.91032

C₂H₃Cl₃O₂

Chloral hydrate

266. B = C₂H₆O

Ethyl alcohol (299)¹

(±0.025%)(265)

Wt. % B	<i>d</i> ₄ ^{20.2}
100.000	0.7910
99.500	0.7933
95.004	0.8119
90.008	0.8444
80.014	0.8946
60.021	1.0208
40.021	1.1845
20.014	1.4014
Wt. % B	<i>d</i> ₄ ⁴⁴
100.000	0.7700
99.500	0.7724
95.004	0.7931
90.008	0.8227
80.014	0.8722
60.021	1.0023
40.021	1.1576
20.014	1.3705

267. B = C₇H₈ (299)¹

(±0.025%)(265)

Wt. % B	<i>d</i> ₄ ^{20.2}
100.00	0.86511
99.80	0.86584
98.00	0.87245
95.00	0.88413
90.00	0.90384
80.01	0.95073
60.02	1.07037
Wt. % B	<i>d</i> ₄ ⁴⁴
100.00	0.84288
99.80	0.84351
98.00	0.84950
95.00	0.86069
90.00	0.87932
80.01	0.92480
60.02	1.04270
40.02	1.18594

v. also 91

C₂H₃N

Acetonitrile

268. B = C₂H₆O

Ethyl alcohol

(0-100 Wt. % B)(322)

*d*₄⁰ = (0.805 + 0.047 ×

Wt. % A) ± 0.5%

269. B = C₃H₅NO

Lactonitrile

(±0.05%)(329)

Wt. % A	<i>d</i> ₄ ⁰
100.00	0.8173
78.80	0.8626
55.23	0.9095
27.23	0.9589
0.00	1.0062
Wt. % A	<i>d</i> ₄ ²⁵
100.00	0.7896
78.80	0.8374
55.23	0.8865
27.23	0.9356
0.00	0.9845

270. B = C₈H₂₀IN

Tetraethylammonium iodide
(330, 331)¹

271. B = C₁₂H₂₈IN

Tetrapropylammonium iodide
(330, 331)¹

v. also 186

C₂H₃NS

Methyl thiocyanate

272. B = C₈H₂₀IN

Tetraethylammonium iodide
(330)¹

C₂H₄Br₂

Ethylene bromide

274. B = C₂H₄Cl₂

Ethylene chloride

(±0.025%)(23)

Wt. % A	<i>d</i> ₄ ²⁰
100.000	2.1804
68.603	1.9064
42.726	1.6696
19.322	1.4455
0.000	1.2551

275. B = C₂H₄O₂

Acetic acid (14)

(±0.05%)(92)

Mol % B	<i>d</i> ₄ ¹⁵
0.00	2.1851
26.51	1.9559
36.23	1.8625
54.17	1.6736
63.21	1.5689
83.45	1.3065
100.00	1.0558

276. B = C₃H₈O

Propyl alcohol

(±0.01%)(286, 290)

Wt. % A	<i>d</i> ₄ ^{18.07}
0.000	0.80659
10.008	0.86081
20.952	0.92908
29.835	0.99300
40.732	1.08453
49.948	1.17623
60.094	1.29695
70.012	1.44175
80.089	1.62640
90.191	1.86652
100.000	2.18300

277. B = C ₄ H ₅ Cl ₃ O ₂ Ethyl trichloroacetate (158)	
278. B = C ₄ H ₇ ClO ₂ Ethyl chloroacetate (158)	
279. B = C ₄ H ₁₀ O Ethyl ether (61)	
280. B = C ₅ H ₁₀ Amylene (61)	
281. B = C ₆ H ₄ Br ₂ <i>p</i> -Dibromobenzene (158)	
282. B = C ₆ H ₅ Cl (122) ¹	
283. B = C ₆ H ₅ NO ₂ Nitrobenzene (±0.05%)(220)	
Wt. % A	<i>d</i> ₄ ²⁰
100.00	2.1800
54.54	1.5873
38.27	1.4466
0.00	1.2033
284. B = C ₆ H ₆ (31, 1, 61, 158) (±0.0075%)(171)	
Wt. % B	<i>d</i> ₄ ²⁵
0.000	2.16855
39.359	1.65077
66.066	1.30527
100.000	0.87793
285. B = C ₆ H ₁₀ O ₃ Ethyl acetoacetate (158)	
286. B = C ₆ H ₁₂ Cyclohexane (±0.25%)(15)	
Mol % A	<i>d</i> ₄ ¹⁵
0	0.786
10	0.897
20	1.033
30	1.137
40	1.265
50	1.403
60	1.544
70	1.691
80	1.847
90	2.015
100	2.187
287. B = C ₇ H ₈ (±0.025%)(285)	
Wt. % A	<i>d</i> ₄ ²⁵
0	0.8627
10	0.9196
20	0.9819
30	1.0518
40	1.1381
50	1.2323
60	1.3527
70	1.4922
80	1.6653
90	1.8822
100	2.1758
288. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (158)	
289. B = C ₇ H ₁₆ Heptane (61)	
290. B = C ₈ H ₈ O ₂ Methyl benzoate (158)	

291. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (220) ¹ (±0.075%)(221, 228)	
a	10 ³ b
(18.1°–30.55°)	
100.00 Wt. % A	
2.1842	2.097(<i>t</i> – 18.1)
(18.02°–27.82°)	
94.41 Wt. % A	
2.0828	1.990(<i>t</i> – 18.02)
(16°–60°)	
90.16 Wt. % A	
2.0416	1.803(<i>t</i> – 16)
292. B = C ₁₀ H ₈ Naphthalene (158) (±0.0075%)(54)	
Wt. % A	<i>d</i> ₄ ¹⁸
100.000	2.18376
99.328	2.16715
98.662	2.15094
293. B = C ₁₂ H ₁₀ N ₂ Azobenzene (158)	
294. B = C ₁₂ H ₁₈ O ₃ Diethyl diacetyltartrate (273) (67.3°–99.0°)(±0.25%)	
a	10 ³ b
100.00 Mol % A	
2.080	2.492(<i>t</i> – 67.3)
94.37 Mol % A	
1.932	1.956(<i>t</i> – 67.3)
84.84 Mol % A	
1.739	1.736(<i>t</i> – 67.3)
57.01 Mol % A	
1.408	1.357(<i>t</i> – 67.3)
32.10 Mol % A	
1.244	1.167(<i>t</i> – 67.3)
11.35 Mol % A	
1.150	1.042(<i>t</i> – 67.3)
0.00 Mol % A	
1.109	0.915(<i>t</i> – 67.3)
295. B = C ₁₄ H ₁₀ Phenanthrene (158)	
296. B = C ₁₈ H ₁₆ O ₆ <i>act.</i> Methyl dibenzoylglycerate (90)	
297. B = C ₂₀ H ₃₈ O ₂ Ethyl oleate (158)	
298. B = C ₂₆ H ₃₀ O ₈ Isobutyl dibenzoyl- <i>d</i> -tartrate (221) (47°–100°)(±0.05%)	
9.2 Wt. % B	
a	10 ³ b
1.9584	1.932(<i>t</i> – 47)
<i>v. also</i> 7, 35, 92, 1266, 1273	
C ₂ H ₄ Cl ₂ Ethylidene chloride	
300. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(228)	

a	10 ³ b
(17.6°–29.25°)	
0.00 Wt. % B	
1.1790	1.561(<i>t</i> – 17.6)
(19.91°–27.87°)	
4.65 Wt. % B	
1.1764	1.508(<i>t</i> – 19.91)
(19.27°–28.97°)	
10.70 Wt. % B	
1.1790	1.494(<i>t</i> – 19.27)
(19.9°–27.71°)	
34.24 Wt. % B	
1.1853	1.345(<i>t</i> – 19.9)
C ₂ H ₄ Cl ₂ Ethylene chloride	
301. B = C ₂ H ₄ O ₂ Acetic acid (92) ¹	
302. B = C ₄ H ₁₀ O Ethyl ether <i>d</i> ₄ ^t = (±0.0075%)(101)	
100.00 Wt. % B	
1.35729	(1 + 0.0015006 <i>t</i> + 0.05437 <i>t</i> ²)
85.041 Wt. % B	
1.26661	(1 + 0.0014410 <i>t</i> + 0.05399 <i>t</i> ²)
69.305 Wt. % B	
1.17291	(1 + 0.0014007 <i>t</i> + 0.05315 <i>t</i> ²)
50.125 Wt. % B	
1.06124	(1 + 0.0013266 <i>t</i> + 0.05280 <i>t</i> ²)
29.907 Wt. % B	
0.94649	(1 + 0.0012439 <i>t</i> + 0.05224 <i>t</i> ²)
14.798 Wt. % B	
0.86228	(1 + 0.0011702 <i>t</i> + 0.05212 <i>t</i> ²)
0.000 Wt. % B	
0.78046	(1 + 0.0011109 <i>t</i> + 0.05170 <i>t</i> ²)
303. B = C ₆ H ₆ (35, 99, 351) (±0.25%)(79)	
Mol % B	<i>d</i> ₄ ⁰
0	1.270
30	1.159
60	1.047
100	0.884
Mol % B	<i>d</i> ₄ ¹⁹
0	1.252
30	1.130
60	1.020
100	0.870
(±0.025%)(31, 171)	
Mol % B	<i>d</i> ₄ ²⁰
100.000	0.8779
79.515	0.9452
59.890	1.0132
39.517	1.0881
20.470	1.1623
0.000	1.2472

(±0.025%)(23)	
Wt. % B	<i>d</i> ₄ ²⁰
0.000	1.2548
4.313	1.2360
16.154	1.1857
23.185	1.1570
38.945	1.0946
47.539	1.0618
56.776	1.0275
67.592	0.9884
78.397	0.9507
88.994	0.9149
94.882	0.8953
100.000	0.8787
(±0.25%)(79)	
Mol % B	<i>d</i> ₄ ⁵⁰
0	1.215
30	1.092
60	0.977
100	0.845
304. B = C ₈ H ₈ O Acetophenone (±0.1%)(270)	
Mol % B	<i>d</i> ₄ ²⁵
100.00	1.025
88.82	1.042
64.19	1.081
30.58	1.158
0.00	1.248
305. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(228)	
a	10 ³ b
(18.5°–27.15°)	
0.00 Wt. % B	
1.2553	1.468(<i>t</i> – 18.5)
(18.66°–24.05°)	
5.87 Wt. % B	
1.2502	1.428(<i>t</i> – 18.66)
(18.76°–31.72°)	
11.73 Wt. % B	
1.2461	1.398(<i>t</i> – 18.76)
(18.15°–30.65°)	
22.04 Wt. % B	
1.2406	1.344(<i>t</i> – 18.15)
(18.15°–27.12°)	
49.72 Wt. % B	
1.2262	1.216(<i>t</i> – 18.15)
<i>v. also</i> 36, 274	
C ₂ H ₄ O Acetaldehyde	
306. B = C ₂ H ₆ O Ethyl alcohol (±0.025%)(55)	
Mol % B	<i>d</i> ₄ ⁰
0.0	0.8050
22.6	0.8704
33.3	0.8947
40.8	0.9080
49.7	0.9061
51.1	0.9044
58.0	0.8944
68.9	0.8751
84.3	0.8413
100.0	0.8063

C₂H₄O.—(Continued)
B = C₂H₆O.—(Continued)
 (±0.025%)(⁵⁵)

Mol % B	d_4^{18}
0.00	0.7834
15.72	0.8277
24.92	0.8474
33.14	0.8601
46.14	0.8715
49.68	0.8719
55.44	0.8709
63.50	0.8627
70.30	0.8501
81.52	0.8296
86.98	0.8200
100.00	0.7907

(±0.0025%)(²⁰¹)

Wt. % B	d_4^{25}
100.000	0.785101
99.977	0.785144
99.860	0.785394
99.534	0.786030

307. B = C₆H₆ (²⁷⁸)
 (0–100 Wt. % B)

$$d_4^{15} = (0.797 + 0.0387 \times \text{Wt. \% B}) \pm 0.25\%$$

C₂H₄O₂

Acetic acid

308. B = C₂H₅Br
 Ethyl bromide
 (±0.05%)(⁹²)

Mol % A	d_4^{15}
0.00	1.4564
31.31	1.3420
50.27	1.2685
63.41	1.2154
70.26	1.1872
83.10	1.1320
100.00	1.0558

309. B = C₂H₅NO₃
 Ethyl nitrate (⁹²)¹

310. B = C₂H₆O
 Ethyl alcohol
 (±0.1%)(¹⁰⁸)

Wt. % A	d_4^{18}
100.00	1.057
75.70	0.978
47.06	0.903
25.00	0.851
6.29	0.807
0.00	0.793

(±0.05%)(²⁶³)

Wt. % A	d_4^{20}
100.000	1.0476
84.805	1.0036
69.884	0.9614
49.923	0.9078
30.568	0.8593
15.142	0.8236

311. B = C₃H₆Br₂
n-Propylene bromide
 (±0.05%)(⁹²)

Mol % A	d_4^{15}
0.000	1.9612
47.396	1.6472
70.310	1.4349
88.255	1.2235
100.000	1.0558

312. B = C₃H₆OAcetone (⁷⁹)(±0.05%)(¹⁵¹)

Mol % A	d_4^{25}
0.00	0.7874
9.96	0.8091
20.35	0.8353
30.25	0.8569
40.49	0.8848
49.86	0.9065
59.73	0.9334
69.68	0.9609
80.15	0.9907
90.37	1.0255
100.00	1.0499

(±0.025%)(¹⁷⁸)

50 Wt. % A

<i>t</i>	d_4^t
0	0.93639
25	0.90840
40	0.89192
55	0.87518
70	0.85784

313. B = C₃H₆O₂

Propionic acid

(±0.1%)(³²⁷)

Wt. % A	d_4^{30}
0.00	0.983
23.04	0.995
49.41	1.012
64.62	1.020
78.78	1.026
100.00	1.046

314. B = C₄H₆O₃

Acetic anhydride

(±0.075%)(^{68, 150})

Wt. % A	d_4^{15}
0.00	1.0850
10.05	1.0816
30.05	1.0753
50.03	1.0689
69.93	1.0631
90.03	1.0570
100.00	1.0550

Wt. % A	$d_4^{16.5}$
0.00	1.0096
10.05	1.0058
30.05	1.0021
50.03	0.9961
69.93	0.9914
90.03	0.9860
100.00	0.9853

315. B = C₄H₈O₂Butyric acid (^{168, 169})(±0.075%)(^{32, 289})

Wt. % A	d_4^{20}
0.00	0.9723
24.11	0.9884
46.76	1.0056

Wt. % A	d_4^{20}
73.97	1.0288
100.00	1.0524

316. B = C₄H₈O₂

Ethyl acetate

(±0.05%)(¹⁵¹)

Mol % A	d_4^{25}
0.00	0.8949
10.49	0.9093
20.70	0.9212
30.37	0.9309
39.90	0.9418
49.85	0.9557
59.96	0.9697
69.88	0.9850
80.11	1.0015
87.42	1.0165
100.00	1.0499

317. B = C₄H₁₀OEthyl ether (¹⁴)(±0.25%)(³¹⁶)

Wt. % A	d_4^{18}
0.00	0.717
27.09	0.796
49.36	0.867
59.63	0.902
69.04	0.935
84.85	0.995
88.45	1.011
100.00	1.055

318. B = C₅H₅NPyridine (²⁶⁶)(±0.25%)(⁷⁹)

(18.4°–99.0°)

a | 10³b

0.0 Mol % A	
0.988	1.005 (<i>t</i> – 18.4)
50.0 Mol % A	
1.037	0.966 (<i>t</i> – 18.4)
80.0 Mol % A	
1.079	1.005 (<i>t</i> – 18.4)
82.5 Mol % A	
1.082	1.012 (<i>t</i> – 18.4)
85.0 Mol % A	
1.083	1.073 (<i>t</i> – 18.4)
100.0 Mol % A	
1.056	1.142 (<i>t</i> – 18.4)

(±0.25%)(³¹²)

Mol % A	d_4^{20}
0.00	0.976
26.20	1.000
42.10	1.018
51.90	1.032
59.90	1.046
61.70	1.050
77.95	1.076
89.60	1.081
100.00	1.051

319. B = C₆H₅Br (⁹²)¹320. B = C₆H₅Cl (⁹²)¹321. B = C₆H₅NO₂ (¹⁴)

322. B = C₆H₆ (^{14, 32, 91, 92, 99, 124, 133, 135, 233})
 (±0.005%)(³¹⁹)

Wt. % A	$d_4^{12.87}$
0.000	0.88638
4.049	0.89071
8.016	0.89522
19.394	0.90904
23.399	0.91434

(±0.1%)(³⁶¹)

Wt. % B	d_4^{20}
0.000	1.0532
0.230	1.0512
0.523	1.0504
0.940	1.0496
2.620	1.0452
4.738	1.0409
13.360	1.0250

(±0.005%)(¹³⁴)

Wt. % A	d_4^{25}
0.000	0.87368
11.634	0.88678
23.614	0.90153
34.008	0.91580
44.857	0.93198
54.459	0.94743
63.968	0.96439
73.819	0.98341
82.321	1.00142
91.338	1.02218
100.000	1.04390

Wt. % A	d_4^{50}
0.000	0.84680
11.634	0.85939
23.614	0.87387
34.008	0.88784
44.857	0.90385
54.459	0.91935
63.968	0.93614
73.819	0.95517
82.321	0.97299
91.338	0.99377
100.000	1.01561

323. B = C₆H₇NAniline (^{79, 266, 307})(±0.005%)(³¹⁹)

Wt. % A	$d_4^{12.87}$
100.000	1.02780
96.140	1.03118
94.234	1.03280
89.853	1.03733
87.447	1.03985

(±0.1%)(²⁵⁰)

Wt. % A	d_4^{21}
100	1.053
90	1.076
80	1.089
70	1.092
60	1.086
50	1.075
40	1.064
30	1.052
20	1.041
10	1.029
0	1.018

(±0.025%)(178)	
56 Wt. % A	
a	10 ³ b
1.0822	1.087(t - 25)

323.5. B = C₆H₁₂O₃
Paraldehyde
(±0.1%)(361)

Wt. % B	d ₄ ¹⁵
0.000	1.0466
0.327	1.0465
1.634	1.0460
4.572	1.0445
8.185	1.0416
23.120	1.0315
41.800	1.0190
70.315	1.0064
88.525	0.9981
94.000	0.9958
97.690	0.9915
98.705	0.9910
99.422	0.9905
100.000	0.9905
Wt. % B	d ₄ ²⁰
0.000	1.0478
0.525	1.0476
0.895	1.0475
2.623	1.0473
4.482	1.0464
8.195	1.0416
13.200	1.0400
22.620	1.0355
41.600	1.0245
70.405	1.0100
88.570	1.0012
94.015	0.9978
97.701	0.9958
98.797	0.9953
99.425	0.9950
100.000	0.9948

324. B = C₆H₁₄
Hexane (14)

325. B = C ₇ H ₈ (14)	
(±0.005%)(319)	
Wt. % A	d ₄ ^{12.87}
0.000	0.87233
3.017	0.87617
7.018	0.88140
12.121	0.88820
14.429	0.89141

(±0.05%)(92)	
Mol % A	d ₄ ¹⁵
0.000	0.8688
18.010	0.8854
28.879	0.8973
40.897	0.9127
43.583	0.9164
49.541	0.9255
58.264	0.9402
67.269	0.9578
82.039	0.9939
91.555	1.0234
100.000	1.0558

(±0.05%)(135)	
Wt. % A	d ₄ ¹⁶
9.606	0.8813
27.446	0.9072
38.492	0.9248

326. B = C₈H₈O
Acetophenone
(±0.05%)(151)

Mol % A	d ₄ ²⁵
0.00	1.0263
9.98	1.0272
21.07	1.0287
29.35	1.0300
42.53	1.0325
48.85	1.0338
60.03	1.0365
69.98	1.0390
80.02	1.0420
90.13	1.0453
100.00	1.0499

327. B = C₈H₁₀
Xylene, (±0.05%)(92)

Mol % A	d ₄ ¹⁵
0.000	0.8675
23.567	0.8874
32.443	0.8969
43.491	0.9106
49.624	0.9192
59.612	0.9357
70.037	0.9568
83.632	0.9924
100.000	1.0558

328. B = C₉H₁₀O₂
Ethyl benzoate (151)
(0-100 Mol % A)
d₄²⁵ = (1.046 + 0.04 ×
Mol % A) ± 0.1%

329. B = C₉H₁₄O₆
Ethyl diacetylgllycerate (active)
(90)

330. B = C₁₀H₁₃NO₂
Phenacetine (292)²

331. B = C₁₀H₁₄N₂
Nicotine (93)¹

332. B = C ₁₀ H ₁₆ O	
Camphor (175, 323, 342)	
(±0.05%)(100, 170, 343)	
Wt. % A	d ₄ ²⁰
100	1.0502
90	1.0340
80	1.0300
70	1.0204
60	1.0111
50	1.0021
40	0.9939
30	0.9862

333. B = C₁₂H₁₀N₂
Azobenzene (318)¹

334. B = C₁₃H₁₀O₃
Salol (292)²

335. B = C₁₆H₁₈O₇
Diethyl monobenzoyltartrate
(89)

336. B = C₁₆H₂₀O₇
Diethyl mono-*o*-toluyltartrate
(89)

337. B = C₁₆H₂₀O₇
Diethyl mono-*m*-toluyltartrate
(89)

338. B = C₁₆H₂₀O₇
Diethyl mono-*p*-toluyltartrate
(89)

339. B = C₁₈H₁₆O₆
d-Methyl dibenzoylglycerate
(90)

339.5. B = *l*-Turpentine
(0.05%)(170, 263, 342)

Wt. % A	d ₄ ²⁰
100	1.0476
90	1.0120
80	0.9972
70	0.9748
60	0.9542
50	0.9351
40	0.9180
30	0.9027
20	0.8883
10	0.8756
0	0.8648

v. also 8, 37, 93, 152, 165, 187,
234, 275, 301, 1273.5, 1274

C₂H₄O₂

Methyl formate

340. B = C₄H₅Cl₃O₂
Ethyl trichloroacetate (158)

341. B = C₄H₇ClO₂
Ethyl chloroacetate (158)

342. B = C₄H₈O₂
Ethyl acetate (158)

343. B = C₄H₁₀O
Ethyl ether (158)

344. B = C₆H₄Br₂
p-Dibromobenzene (158)

345. B = C₆H₆ (142, 158)

346. B = C₆H₁₀O₃
Ethyl acetoacetate (158)

347. B = C₆H₁₄
Hexane (158)

348. B = C₈H₈O₂
Methyl benzoate (158)

349. B = C₈H₂₀IN
Tetraethylammonium iodide
(331)¹

350. B = C₁₀H₈
Naphthalene (158)

351. B = C₁₄H₁₀
Phenanthrene (158)

352. B = C₂₀H₃₈O₂
Ethyl oleate (158)

v. also 38

C₂H₅Br

Ethyl bromide

353. B = C₂H₅I (103)

354. B = C₅H₅N
Pyridine (14)

355. B = C₆H₄Br₂
p-Dibromobenzene (158)
(±0.005%)(318)

Wt. % B	d ₄ ²⁵
0.000	1.43841
3.565	1.45332
3.854	1.45429

356. B = C₈H₁₄O₆
Dimethyl *d*-dimethoxysuccinate

(±0.075%)(222)

a	10 ³ b
(65.3°-153°)	
100.00 Wt. % B	
1.1250	1.052(t - 65.3)
(15.8°-88.5°)	
9.02 Wt. % B	
2.0242	1.929(t - 15.8)

357. B = C₈H₁₄O₆
Ethyl tartrate

(±0.05%)(228)

a	10 ³ b
(18.32°-22.5°)	
0.00 Wt. % B	
1.4631	2.033(t - 18.32)
(18.47°-21.6°)	
2.02 Wt. % B	
1.4558	2.959(t - 18.47)
(18.7°-20.93°)	
4.98 Wt. % B	
1.4460	1.974(t - 18.7)
(18.95°-27.20°)	
10.92 Wt. % B	
1.4278	1.928(t - 18.95)
(18.85°-20.10°)	
30.58 Wt. % B	
1.3720	1.681(t - 18.85)
(19.57°-21.20°)	
65.28 Wt. % B	
1.2828	1.228(t - 19.57)
(±0.05%)(343)	

Wt. % B	d ₄ ²⁰
69.600	1.3867
44.472	1.5899
22.494	1.8298
11.583	1.9814
5.532	2.0789
2.311	2.1362
1.197	2.1567
0.424	2.1713
0.000	2.1789

358. B = C₁₀H₁₄N₂
Nicotine

(±0.05%)(343)

Wt. % A	d ₄ ²⁰
0.00	1.0100
41.88	1.3009
63.71	1.5310
82.58	1.8096
89.86	1.9467
100.00	2.1789

C₂H₅Br.—(Continued)

359. B = C₁₀H₁₆O
Camphor
(±0.05%)(³⁴³)

Wt. % B	d_4^{20}
0.00	2.1789
1.00	2.1513
1.86	2.1279
2.99	2.0983
3.87	2.0759
36.23	1.4929

360. B = C₁₀H₁₈O₆

Dipropyl tartrate
(±0.1%)(³⁴⁰)

a | 10^{3b}
(20°–60°)

0.00 Wt. % A

1.1389 | 0.905 (*t* – 20)
(20°–70°)

25.29 Wt. % A

1.2916 | 1.116 (*t* – 20)

55.00 Wt. % A

1.5293 | 1.324 (*t* – 20)

84.71 Wt. % A

1.8868 | 1.698 (*t* – 20)

361. B = C₁₂H₂₈IN

Tetrapropylammonium iodide
(³³¹)¹

v. also 308

C₂H₅I

Ethyl iodide

362. B = C₄H₈O₂

Ethyl acetate (¹⁵⁸, ¹⁷¹)
(±0.025%)(²³)

Wt. % B	d_4^{20}
100.000	0.9006
93.775	0.9525
87.072	1.0100
78.358	1.0868
70.902	1.1547
61.278	1.2454
52.337	1.3333
44.697	1.4114
30.202	1.5679
16.129	1.7316
0.000	1.9365

(±0.005%)(¹³⁴, ²⁹⁰)

Wt. % B	d_4^{25}
100.000	0.89422
80.918	0.99263
64.993	1.09390
50.483	1.20707
40.259	1.30314
31.471	1.39950
25.434	1.47573
17.208	1.59373
10.907	1.69938
5.030	1.81215
0.000	1.92282

(±0.005%)(¹³⁴, ²⁹⁰)

Wt. % B	d_4^{50}
100.000	0.86307
80.918	0.95824
64.993	1.05648

Wt. % B	d_4^{50}
50.483	1.16636
40.259	1.25981
31.471	1.35355
25.434	1.42776
17.208	1.54288
10.907	1.64612
5.030	1.75664
0.000	1.86491

363. B = C₄H₁₀O

Ethyl ether (¹⁶⁵)¹

364. B = C₆H₆ (²⁵⁴)

365. B = C₈H₁₀

Xylene (²⁵⁴)

366. B = C₈H₁₀O

Phenetole

(±0.1%)(²⁶⁹)

Mol % A	d_4^0
100.00	1.9745
90.44	1.8026
66.02	1.5295
45.29	1.3207
26.15	1.1630
9.11	1.0366
0.00	0.9841

367. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(²²⁸)

a | 10^{3b}
(19.25°–32.35°)

0.00 Wt. % B

1.9377 | 2.306 (*t* – 19.25)

(18.58°–32.9°)

5.17 Wt. % B

1.8748 | 2.207 (*t* – 18.58)

(18.22°–26.01°)

10.63 Wt. % B

1.8143 | 2.080 (*t* – 18.22)

(18.07°–25.33°)

32.77 Wt. % B

1.6067 | 1.640 (*t* – 18.07)

368. B = C₁₀H₈

Naphthalene (⁵⁴)¹

v. also 39, 157, 187.5, 353, 1271,
1272

C₂H₅NO

Acetamide

369. B = C₂H₆O

Ethyl alcohol (²⁹⁹)¹

(±0.01%)(³³)

Wt. % B	d_4^{30}
100.000	0.78090
95.837	0.78972
93.429	0.79494
91.203	0.79985

370. B = C₅H₅N, Pyridine

(±0.05%)(⁷⁰)

Wt. % B	d_4^{25}
100.00	0.9746
96.13	0.9794
94.35	0.9814
91.49	0.9826
83.73	0.9959

C₂H₅NO₃

Ethyl nitrate

371. B = C₇H₁₆

Heptane (²³⁶)¹

372. B = C₈H₂₀IN

Tetraethylammonium iodide
(³³⁰)¹

373. B = C₁₀H₇Br

α-Bromonaphthalene (²³⁶)¹

374. B = C₁₂H₂₈IN

Tetrapropylammonium iodide
(³³⁰)¹

v. also 40, 309

C₂H₆N₂O

Dimethylnitrosamine

375. B = C₈H₂₀IN

Tetraethylammonium iodide
(³³⁰)¹

C₂H₆O

Ethyl alcohol

376. B = C₃H₆O

Acetone (³³, ¹³⁹, ¹⁴⁴)

(±0.1%)(³⁵⁹)

Vol. % B	d_4^0
0	0.8082
25	0.8124
50	0.8139
75	0.8138
100	0.8132
Vol. % B	d_4^{25}
0	0.7872
25	0.7886
50	0.7879
75	0.7872
100	0.7856

(±0.1%)(³⁶¹)

Wt. % B	d_4^{20}
0.000	0.7934
0.605	0.7932
0.929	0.7931
2.427	0.7928
4.655	0.7925
5.455	0.7924
12.130	0.7923
19.800	0.7921
23.290	0.7921

50 Wt. % A

(±0.025%)(¹⁷⁸)

<i>t</i>	d_4^t
0	0.9363
25	0.9083
40	0.8918
55	0.8751
70	0.8577

377. B = C₃H₆O₂

Methyl acetate

(±0.025%)(to 55°)(¹⁷⁸)

50 Wt. % A

a	10 ^{3b}
0.88174	1.052 <i>l</i>

378. B = C₃H₇NO

Propionamide (¹⁸⁰)

(±0.01%)(³³)

Wt. % A	d_4^{30}
100.000	0.78078
96.897	0.78560
92.990	0.79628
89.705	0.82371

379. B = C₃H₇NO₂

Urethane (²⁹⁹)^{1,2}

(±0.01%)(^{261.1})

Wt. % B	d_4^{20}
0	0.7892
1	0.7915
2	0.7928
3	0.7962
4	0.7986
5	0.8010
10	0.8130
20	0.8375
30	0.8628
40	0.8895
50	0.9177
60	0.9470

381. B = C₃H₅O

n-Propyl alcohol

(0–100 Wt. % A)(⁶⁵)

$d_4^{15} = (0.80753 -$
0.0001386 × Wt. % A)
±0.025%

(±0.1%)(¹¹³, ¹¹⁸)

Wt. % A	d_4^{25}
100.0	0.7869
91.9	0.7888
82.1	0.7904
43.4	0.7928
11.4	0.7975
8.8	0.7981
4.8	0.7988
0.0	0.8006

382. B = C₃H₅O₃

Glycerol (²⁰⁰)¹

(±0.005%)(³¹⁹)

Wt. % A	$d_4^{12.87}$
100.000	0.79586
96.842	0.80659
95.393	0.81148
88.048	0.83723
73.275	0.89218

(±0.05%)(³⁴⁶)

a | 10^{3b}

0.00 Wt. % A

1.2507 | 0.630*l*

20.00 Wt. % A

1.1416 | 0.660*l*

33.33 Wt. % A

1.0742 | 0.725*l*

50.02 Wt. % A

0.9975 | 0.750*l*

66.67 Wt. % A

0.9371 | 0.805*l*

100.00 Wt. % A

0.8128 | 0.850*l*

383. B = C₄H₅NO₂

Succinimide (²⁹⁹)^{1,2}

384. B = C₄H₅NS

Allyl isothiocyanate (¹⁹²,¹
³²⁸)

385. B = C ₄ H ₆ O ₄ Succinic acid (±0.0075%)(264)		t		d ₄ ^t		394. B = C ₅ H ₅ N Pyridine (±0.05%)(130)		403. B = C ₆ H ₅ ClO <i>m</i> -Chlorophenol (305) ¹	
Wt. % A	d ₄ ^{14.2}	0		0.86207		Wt. % A	d ₄ ^{15.5}	404. B = C ₆ H ₅ ClO <i>p</i> -Chlorophenol (305) ¹	
100.000	0.79595	25		0.84424		0.00	0.9873	405. B = C ₆ H ₅ NO ₂ Nitrobenzene (34, ¹ 192, ¹ 328 ¹) (±0.025%)(247)	
99.844	0.79654	40		0.82665		10.48	0.9640	Mol % A	d ₄ ²⁰
99.690	0.79710	55		0.80860		25.98	0.9321	100.00	0.79110
99.382	0.79829	390. B = C ₄ H ₉ NO Butyramide (±0.01%)(33)				45.61	0.8931	97.71	0.80855
98.754	0.80020	Wt. % A	d ₄ ³⁰			100.00	0.7934	95.13	0.82747
97.553	0.80509	100.000	0.78090			(±0.05%)(73)		92.10	0.84878
386. B = C ₄ H ₆ O ₅ Malic acid (194) ¹		97.374	0.78501			Wt. % A	d ₄ ²⁵	88.87	0.86987
387. B = C ₄ H ₆ O ₆ Tartaric acid (296, ¹ 303) (20°–50°)(±0.1%)(339)		94.372	0.78991			100.00	0.7904	85.54	0.89052
a	10 ^{3b}	391. B = C ₄ H ₁₀ O Isobutyl alcohol (±0.025%)(65)				70.08	0.8432	82.03	0.91097
93.55 Wt. % A		Wt. % B	d ₄ ¹⁵			50.03	0.8845	77.01	0.93824
0.8199 | 0.873(<i>t</i> – 20)		0.00	0.79367			33.93	0.9242	70.41	0.97144
88.37 Wt. % A		6.30	0.79435			30.04	0.9456	60.46	1.01192
0.8480 | 0.873(<i>t</i> – 20)		12.34	0.79488			0.00	0.9783	48.16	1.06451
83.82 Wt. % A		29.06	0.79670			395. B = C ₅ H ₁₀ Amylene (103)		Mol % A	d ₄ ³⁰
0.8736 | 0.873(<i>t</i> – 20)		49.49	0.79905			396. B = C ₅ H ₁₂ O Amyl alcohol (168, 169)		100.00	0.78063
80.27 Wt. % A		59.09	0.80022			396.5. B = C ₅ H ₁₂ O Isoamyl alcohol (±0.1%)(361)		97.63	0.79848
0.8931 | 0.880(<i>t</i> – 20)		68.54	0.80142			Wt. % B	d ₄ ^{18.4}	95.11	0.81688
388. B = C ₄ H ₈ O ₂ Butyric acid (0–100 Wt. % B)(108) d ₄ ¹⁸ = (0.7928 + 0.001683 × Wt. % B) ±0.1%		89.80	0.80430			0.000	0.7963	92.04	0.83808
389. B = C ₄ H ₈ O ₂ Ethyl acetate (±0.005%)(182)		100.00	0.80567			0.915	0.8030	88.75	0.85960
Wt. % B	d ₄ ⁰	392. B = C ₄ H ₁₀ O Ethyl ether (10, 32, 37, 50, 103, 169, 201, ¹ 240, 252, ¹ 274, 289) (±0.025%)(36)				1.099	0.8033	81.99	0.90090
100.000	0.92455	Wt. % A	d ₄ ¹⁵			0.395	0.8022	77.11	0.92775
94.897	0.91736	0.0	0.7194			1.578	0.8036	70.31	0.96182
89.816	0.91033	9.6	0.7317			3.665	0.8040	61.51	1.00178
84.338	0.90299	16.8	0.7404			5.478	0.8048	47.86	1.05549
83.815	0.90227	18.0	0.7418			7.860	0.8050	Mol % A	d ₄ ³⁰
80.080	0.89741	18.7	0.7427			18.265	0.8065	100.00	0.77329
75.159	0.89107	20.8	0.7452			27.350	0.8075	97.61	0.79129
69.692	0.88419	22.2	0.7468			397. B = C ₆ H ₃ N ₃ O ₆ Trinitrobenzene (129) ^{1,2}		95.11	0.80913
65.412	0.87889	22.7	0.7474			398. B = C ₆ H ₃ N ₃ O ₇ Picric acid (18) ¹ (to 2.22 Wt. % B)(34) d ₄ ³⁰ = (0.78100 + 0.00474 × Wt. % B) ±0.01%		92.05	0.83005
58.900	0.87097	23.0	0.7478			399. B = C ₆ H ₄ Br ₂ <i>p</i> -Dibromobenzene (158)		88.85	0.87075
49.941	0.86036	24.9	0.7501			400. B = C ₆ H ₅ Br Bromobenzene (±0.01%)(34)		81.86	0.89263
39.489	0.84833	25.0	0.7502			Wt. % B	d ₄ ³⁰	77.01	0.91900
28.985	0.83662	25.4	0.7509			0.000	0.78081	70.44	0.95191
14.250	0.82080	25.7	0.7511			3.208	0.79327	62.00	0.99072
5.346	0.81167	25.8	0.7512			4.128	0.79694	47.49	1.04750
0.000	0.80631	26.7	0.7524			5.668	0.80301	Mol % A	d ₄ ⁵⁰
(±0.25%)(101.1)		27.4	0.7533			6.596	0.80666	100.00	0.76329
Wt. % B	d ₄ ^{17.5}	28.3	0.7544			100.000	1.48200	97.58	0.78115
100.00	0.9060	29.7	0.7562			401. B = C ₆ H ₅ Cl Chlorobenzene (±0.01%)(34)		94.94	0.79952
95.63	0.9002	100.0	0.7934			Wt. % B	d ₄ ³⁰	92.12	0.81920
91.21	0.8942	393. B = C ₄ H ₁₂ IN Tetramethylammonium iodide (330) ¹				0.000	0.78081	88.93	0.83988
86.71	0.8880	Wt. % A	d ₄ ²⁵			2.858	0.78773	85.42	0.86113
82.17	0.8817	100.00	0.7882			4.985	0.79287	82.08	0.88118
77.75	0.8753	76.85	0.7726			6.361	0.79623	77.13	0.90822
72.89	0.8685	52.57	0.7548			402. B = C ₆ H ₅ ClO <i>o</i> -Chlorophenol (305) ¹		71.32	0.93802
68.20	0.8615	42.49	0.7468					61.96	0.98103
63.34	0.8572	35.52	0.7412					47.86	1.03619
(±0.025%)(178)		27.01	0.7340					Mol % A	d ₄ ⁶⁰
50 Wt. % B		21.63	0.7295					100.00	0.74650
		13.61	0.7222					97.69	0.77210
		0.00	0.7079					95.07	0.79122

C₂H₆O. —(Continued)	
406. B = C ₆ H ₅ NO ₃ <i>o</i> -Nitrophenol (±0.005%)(³¹⁹)	
Wt. % A	$d_4^{12.87}$
100.000	0.79586
97.570	0.80493
93.528	0.81903
89.008	0.83582
88.790	0.83660
(to 5.261 Wt. % B)(³⁴) $d_4^{30} = (0.78100 + 0.003508 \times \text{Wt. \% B}) \pm 0.01\%$	
407. B = C ₆ H ₅ NO ₃ <i>p</i> -Nitrophenol (to 1.834 Wt. % B)(³⁴) $d_4^{30} = (0.78100 + 0.00368 \times \text{Wt. \% B}) \pm 0.01\%$	
408. B = C ₆ H ₆ (35, 81, ¹ 95, ¹ 103, 139, 233, ¹ 238, ¹ 240, 351, ¹ 361) (±0.075%)(³²)	
Wt. % B	d_4^{20}
100.00	0.7930
78.88	0.8106
47.14	0.8356
20.90	0.8604
0.00	0.8814
(±0.025%)(¹⁷⁸) 50 Wt. % B	
<i>t</i>	d_4^t
0	0.86536
25	0.84060
40	0.82549
55	0.80955
409. B = C ₆ H ₅ BrN <i>p</i> -Bromoaniline (to 4.711 Wt. % B)(³⁴) $d_4^{30} = (0.78100 + 0.00437 \times \text{Wt. \% B}) \pm 0.01\%$	
410. B = C ₆ H ₅ ClN <i>p</i> -Chloroaniline (±0.01%)(³⁴)	
Wt. % A	d_4^{30}
100.000	0.78100
98.781	0.78506
98.638	0.78535
411. B = C ₆ H ₅ N ₂ O ₂ <i>m</i> -Nitroaniline (to 2.694 Wt. % B)(³⁴) $d_4^{30} = (0.78100 + 0.003597 \times \text{Wt. \% B}) \pm 0.01\%$	
412. B = C ₆ H ₅ N ₂ O ₂ <i>p</i> -Nitroaniline (to 0.964 Wt. % B)(³⁴) $d_4^{30} = (0.78100 + 0.003696 \times \text{Wt. \% B}) \pm 0.01\%$	
413. B = C ₆ H ₅ O Phenol (±0.005%)(³¹⁹)	

Wt. % A	$d_4^{12.87}$
100.000	0.79586
96.354	0.80650
94.284	0.81160
91.029	0.81959
85.354	0.83381
79.467	0.84882
414. B = C ₆ H ₆ O ₂ Resorcinol (299) ^{1,2}	
415. B = C ₆ H ₇ N Aniline (140) (±0.01%)(³⁴)	
Wt. % B	d_4^{30}
0.000	0.78081
2.234	0.78592
3.956	0.78976
7.223	0.79693
100.000	1.01300
416. B = C ₆ H ₅ O ₇ Citric acid (296) ^{1,2}	
417. B = C ₆ H ₁₀ O ₃ Ethyl acetoacetate (±0.05%)(⁷¹)	
Wt. % A	d_4^{25}
100.00	0.7875
91.95	0.8025
63.72	0.8605
53.29	0.8832
35.98	0.9244
0.00	1.0222
418. B = C ₆ H ₁₀ O ₈ Citric acid hydrate (296) ^{1,2}	
418.5. B = C ₆ H ₁₂ O ₃ Paraldehyde (±0.1%)(³⁶¹)	
Wt. % B	d_4^{20}
0.000	0.7934
0.710	0.7948
1.047	0.7953
2.830	0.7972
5.200	0.8006
13.835	0.8152
25.000	0.8347
419. B = C ₆ H ₁₃ NO Caproamide (to 3.293 Wt. % B)(³³) $d_4^{30} = (0.78090 + 0.001259 \times \text{Wt. \% B}) \pm 0.01\%$	
420. B = C ₇ H ₅ N Cyanobenzene (192, ¹ 328 ¹)	
421. B = C ₇ H ₆ O ₂ Benzoic acid (293, 296 ^{1,2})	
422. B = C ₇ H ₆ O ₃ Salicylic acid (293, 294, 296, ^{1,2} 303)	
423. B = C ₇ H ₇ NO Benzamide (129, ¹ 299 ^{1,2})	
424. B = C ₇ H ₇ NO ₂ <i>o</i> -Nitrotoluene (192, ¹ 328 ¹) (±0.01%)(³⁴)	

Wt. % A	d_4^{30}
100.000	0.78100
96.867	0.78972
85.787	0.82051
69.002	0.87101
48.032	0.94148
425. B = C ₇ H ₇ NO ₂ <i>m</i> -Nitrotoluene (192, ¹ 328 ¹)	
426. B = C ₇ H ₇ NO ₂ <i>p</i> -Nitrotoluene (34, ¹ 192, ¹ 328 ¹) (0–100 Wt. % B)(¹⁴⁹) $\frac{1}{d_4^{30}} = [1.28035 - 0.0043628 \times \text{Wt. \% B} + 0.053532 \times (\text{Wt. \% B})^2] \pm 0.025\%$	
427. B = C ₇ H ₈ (35, 139) (±0.01%)(³⁴)	
Wt. % A	d_4^{30}
100.000	0.78081
96.891	0.78322
96.014	0.78386
94.655	0.78488
91.768	0.78689
428. B = C ₇ H ₈ O <i>o</i> -Cresol (237) ¹	
429. B = C ₇ H ₈ O Anisole (±0.025%)(⁹)	
Wt. % A	d_4^{25}
100.00	0.7881
84.79	0.8149
70.38	0.8407
57.00	0.8666
44.33	0.8919
32.32	0.9168
20.95	0.9416
10.02	0.9660
0.00	0.9960
430. B = C ₇ H ₈ O ₆ Gallic acid hydrate (296) ^{1,2}	
431. B = C ₇ H ₉ N <i>p</i> -Toluidine (299) ¹ (to 3.952 Wt. % B)(³⁴) $d_4^{30} = (0.78100 + 0.00212 \times \text{Wt. \% B}) \pm 0.01\%$	
432. B = C ₇ H ₉ N 2, 6-Lutidine (±0.05%)(⁷³)	
Wt. % A	d_4^{25}
100.00	0.7904
90.03	0.8038
80.12	0.8197
60.23	0.8515
40.30	0.8803
20.57	0.9074
9.45	0.9210
0.00	0.9322
433. B = C ₇ H ₉ NO ₂ Ammonium benzoate (296) ^{1,2}	
434. B = C ₇ H ₉ NO ₃ Ammonium salicylate (294, 296 ^{1,2})	

435. B = C ₈ H ₅ ClNO <i>p</i> -Chloroacetanilide (±0.01%)(³⁴)	
Wt. % A	d_4^{30}
100.000	0.78100
98.717	0.78515
97.843	0.78794
436. B = C ₈ H ₉ NO Acetanilide (129, ^{1,2} 292, 299, ^{1,2} 303)	
437. B = C ₈ H ₁₀ Xylene (139)	
438. B = C ₈ H ₁₀ O Phenetole (±0.025%)(⁹)	
Wt. % A	d_4^{25}
100.00	0.7881
85.03	0.8108
71.11	0.8331
57.68	0.8552
45.03	0.8767
32.95	0.8982
21.50	0.9195
9.75	0.9422
0.00	0.9619
439. B = C ₈ H ₁₄ O ₃ Ethyl ethylacetoacetate (±0.05%)(⁷¹)	
Wt. % A	d_4^{25}
100.00	0.7875
94.56	0.7953
76.20	0.8271
58.76	0.8588
28.69	0.9165
13.13	0.9495
0.00	0.9750
440. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (170, ¹ 343 ¹) (±0.05%)(203, 288, 344) <i>a</i> | 10 ^{3b} (17.6°–58.2°) 100.00 Wt. % A 0.7934 | 0.880(<i>t</i> –17.6) (20.5°–54.4°) 95.00 Wt. % A 0.8058 | 0.891(<i>t</i> –20.5) (17.4°–65.8°) 89.06 Wt. % A 0.8265 | 0.902(<i>t</i> –17.4) (13.1°–69.0°) 80.00 Wt. % A 0.8596 | 0.932(<i>t</i> –13.1) (16.7°–62.8°) 60.00 Wt. % A 0.9273 | 0.954(<i>t</i> –16.7) (17.5°–59.1°) 39.99 Wt. % A 1.0079 | 0.988(<i>t</i> –17.5) (16.8°–99.4°) 0.00 Wt. % A 1.2085 | 1.016(<i>t</i> –16.8)	
441. B = C ₈ H ₂₀ IN Tetraethylammonium iodide (330, ¹ 331 ¹)	

C_2H_7N	
Dimethylamine	
490.1. B = C_2H_8ClN	
Dimethylamine hydrochloride	
($\pm 0.5\%$) (358)	
Wt. % B	$d_4^{33.5}$
0.00	0.727
2.01	0.728
3.99	0.734
8.66	0.740

C_2H_7N	
Ethylamine	
490.2. B = C_2H_8ClN	
Ethylamine hydrochloride	
($\pm 0.5\%$) (358)	
Wt. % B	$d_4^{33.5}$
0.00	0.742
4.07	0.767
9.97	0.771
13.78	0.881

$C_3H_3N_3O_3$	
Cyanuric acid	
491. B = C_5H_5N	
Pyridine (70)	

C_3H_5ClO	
Epichlorohydrin	
492. B = $C_8H_{20}IN$	
Tetraethylammonium iodide	
(329) ¹	

C_3H_5N	
Propionitrile	
493. B = $C_8H_{20}IN$	
Tetraethylammonium iodide	
(330, ¹ 331 ¹)	

494. B = $C_{12}H_{28}IN$	
Tetrapropylammonium iodide	
(330, ¹ 331 ¹)	

C_3H_5NO	
Lactonitrile	
v. 269	

C_3H_5NS	
Ethyl thiocyanate	
495. B = $C_5H_{11}N$	
Piperidine	
($\pm 0.05\%$) (165)	
Mol % A	d_4^{50}
100	0.9672
95	0.9766
75	1.0151
55	1.0534
50	1.0633
45	1.0414
25	0.9474
5	0.8560
0	0.8338

496. B = $C_8H_{20}IN$	
Tetraethylammonium iodide	
(330) ¹	

$C_3H_6Br_2$	
n-Propylene bromide	
v. 311	

C_3H_6O	
Allyl alcohol	
497. B = C_3H_8O	
Propyl alcohol (335) ¹	
498. B = C_6H_6	
($\pm 0.05\%$) (335)	
Wt. % B	d_4^0
100.00	0.9001
84.19	0.8933
81.23	0.8923
0.00	0.8690

499. B = $C_8H_{14}O_6$	
Ethyl tartrate	
($\pm 0.05\%$) (223)	
a	10 ³ b
(8.6°–55.5°)	
28.27 Wt. % B	
0.941 | 0.917(t – 8.6)	
(11.5°–53.0°)	
49.81 Wt. % B	
1.009 | 0.917(i – 11.5)	

C_3H_6O	
Acetone	
500. B = C_3H_7NO	
Propionamide (180)	

501. B = $C_4H_5NO_2$	
Methyl cyanoacetate	
($\pm 0.05\%$) (329)	
Wt. % A	d_4^0
0.00	1.1492
18.97	1.0697
41.28	0.9862
67.83	0.9030
100.00	0.8121
Wt. % A	d_4^{25}
0.00	1.1225
18.97	1.0437
41.28	0.9607
67.83	0.8739
100.00	0.7851

502. B = $C_4H_6O_4$	
Succinic acid	
($\pm 0.0075\%$) (264)	
Wt. % A	$d_4^{12.9}$
100.000	0.80009
99.847	0.80036
99.695	0.80095
99.387	0.80216
98.778	0.80458
97.571	0.80928

503. B = $C_4H_6O_5$	
Malic acid (194) ¹	

504. B = $C_4H_7ClO_2$	
Ethyl chloroacetate (158)	

505. B = C_4H_8O	
Methyl ethyl ketone	
(0–100 Wt. % A)	
($\pm 0.025\%$) (248)	
$d_4^{20} = (0.8052 - 0.03142$	
\times Wt. % A)	
$d_4^{30} = (0.7946 -$	
$0.03151 \times$ Wt. % A)	
$d_4^{40} = (0.7841 -$	
$0.03161 \times$ Wt. % A)	

$d_4^{50} = (0.7734 -$	
0.03172 Wt. % A)	
506. B = $C_4H_{10}O$	
Ethyl ether	
($\pm 0.05\%$) (281)	
Mol % A	d_4^{20}
0	0.7106
20	0.7191
40	0.7312
50	0.7383
60	0.7461
80	0.7645
100	0.7877
($\pm 0.05\%$) (274)	
Mol % A	$d_4^{25.04}$
0.000	0.7080
10.764	0.7146
20.752	0.7209
31.186	0.7280
41.842	0.7356
45.646	0.7385
54.939	0.7456
56.104	0.7465
63.691	0.7525
72.850	0.7607
77.158	0.7640
85.858	0.7720
93.418	0.7792
100.000	0.7859
(0°–32°) ($\pm 0.25\%$) (79)	
a	10 ³ b
0 Mol % A	
0.736 | 1.343t	
30 Mol % A	
0.757 | 1.625t	
70 Mol % A	
0.785 | 1.501t	
100 Mol % A	
0.813 | 1.312t	

507. B = $C_5H_{12}O$	
Amyl alcohol (39) ¹	

508. B = C_6H_5Br	
($\pm 0.1\%$) (270)	
Mol % A	d_4^0
0.00	1.518
15.68	1.445
26.46	1.382
49.85	1.234
71.85	1.074
82.50	0.982
93.75	0.875
100.00	0.812

509. B = C_6H_5Cl	
($\pm 0.1\%$) (270)	
Mol % A	d_4^0
0.00	1.127
15.30	1.094
49.12	1.003
60.30	0.948
84.74	0.878
95.97	0.834
100.00	0.812

510. B = C_6H_5ClO	
o-Chlorophenol	
($\pm 0.01\%$) (28)	

Wt. % A	d_4^0
100.00	0.8148
81.51	0.8800
67.62	0.9364
50.05	1.0138
39.51	1.0638
28.99	1.1175
16.88	1.1824
8.27	1.2282
0.00	1.2737
Wt. % A	d_4^{10}
100.00	0.8032
81.51	0.8689
67.62	0.9256
50.05	1.0032
39.51	1.0532
28.99	1.1068
16.88	1.1716
8.27	1.2170
0.00	1.2622
Wt. % A	d_4^{20}
100.00	0.7914
81.51	0.8577
67.62	0.9148
50.05	0.9924
39.51	1.0427
28.99	1.0961
16.88	1.1607
8.27	1.2058
0.00	1.2508
Wt. % A	d_4^{30}
100.00	0.7795
81.51	0.8466
67.62	0.9040
50.05	0.9818
39.51	1.0321
28.99	1.0855
16.88	1.1499
8.27	1.1946
0.00	1.2397
Wt. % A	d_4^{40}
100.00	0.7676
81.51	0.8354
67.62	0.8931
50.05	0.9712
39.51	1.0215
28.99	1.0747
16.88	1.1392
8.27	1.1834
0.00	1.2282
Wt. % A	d_4^{50}
100.00	0.7557
81.51	0.8242
67.62	0.8822
50.05	0.9601
39.51	1.0109
28.99	1.0641
16.88	1.1284
8.27	1.1723
0.00	1.2170
Wt. % A	d_4^{60}
40.63	0.9948
31.77	1.0391
23.01	1.0847
15.36	1.1241
8.92	1.1579
0.00	1.2058

Wt. % A	d_4^{70}	Wt. % A	$d_4^{9.95}$	Wt. % A	$d_4^{49.8}$	521. B = C ₈ H ₁₀ N ₄ O ₂ Caffeine (292)
40.63	0.9837	100.00	0.8033	25.75	0.9733	
31.77	1.0280	85.81	0.8427	19.24	0.9933	522. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(223)
23.01	1.0735	73.28	0.8769	12.02	1.0150	a | 10 ³ b (13°–46°)
15.36	1.1129	61.94	0.9086	7.19	1.0293	89.99 Wt. % A 0.8304 | 1.085(t – 13) (11.5°–36°)
8.92	1.1467	50.57	0.9407	0.00	1.0502	74.94 Wt. % A 0.8821 | 1.102(t – 11.5)
0.00	1.1945	42.21	0.9642			523. B = C ₈ H ₂₀ IN Tetraethylammonium iodide (330, ¹ 331)
511. B = C ₆ H ₅ NO ₂ Nitrobenzene (±0.1%)(361)			34.78	0.9851		524. B = C ₉ H ₁₁ NO Methylacetanilide (180)
Wt. % A	d_4^{20}	26.26	1.0090	514. B = C ₆ H ₇ N Aniline (±0.25%)(79)		
0.000	1.2048	21.06	1.0237	Mol % A	d_4^{18}	
0.372	1.2016	14.61	1.0420	0	1.021	
0.600	1.1994	7.15	1.0622	30	0.978	
1.366	1.1996	0.00	1.0835	70	0.886	
1.864	1.1993	100.00	0.7914	100	0.810	
3.031	1.1868	85.81	0.8317	Mol % A	d_4^{41}	
7.083	1.1632	73.28	0.8663	0	1.002	
9.730	1.1494	61.94	0.8984	30	0.966	
16.100	1.1176	50.57	0.9309	70	0.863	
(±0.1%)(82)			42.21	100	0.765	
Mol % B	d_4^{25}	34.78	0.9757	(±0.025%)(178)		
100	0.7869	26.26	0.9998	50 Wt. % A		
75	0.8970	21.06	1.0146	t	d_4^t	
50	0.9980	14.61	1.0334	0	0.93268	
25	1.1005	7.15	1.0537	25	0.90893	
0	1.1963	0.00	1.0751	40	0.89118	
512. B = C ₆ H ₆ (33, ¹ 59, ¹ 82, ¹ 139, 141, ¹ 149, 176, 361 ¹) (±0.1%)(355)			100.00	55	0.87720	
Wt. % B	d_4^{10}	90.43	0.8058	70	0.86282	
0.00	0.8042	80.47	0.8338	515. B = C ₆ H ₁₄ , Hexane (±0.1%)(76)		
21.24	0.8323	72.30	0.8573	Wt. % A	d_4^{15}	
49.34	0.8445	62.58	0.8856	0.00	0.6744	
72.14	0.8645	55.33	0.9064	22.84	0.6913	
100.00	0.8893	47.21	0.9331	54.20	0.7272	
Wt. % B	d_4^{20}	39.76	0.9520	63.94	0.7445	
0.00	0.7926	32.81	0.9724	73.41	0.7558	
21.24	0.8102	25.75	0.9935	82.55	0.7684	
49.34	0.8335	19.24	1.0115	91.41	0.7836	
72.14	0.8534	12.02	1.0327	100.00	0.7977	
100.00	0.8784	7.19	1.0466	(±0.1%)(361)		
(±0.1%)(74)			0.00	1.0667		
Wt. % B	d_4^{25}	100.00	0.7678	Wt. % A	d_4^{20}	
0.00	0.8736	90.43	0.7942	0.000	0.6872	
9.33	0.8668	80.47	0.8225	0.402	0.6879	
18.05	0.8565	72.30	0.8462	0.557	0.6881	
24.70	0.8507	62.58	0.8744	9.985	0.6930	
39.31	0.8381	55.33	0.8953	18.135	0.6990	
43.28	0.8347	47.21	0.9221	516. B = C ₇ H ₇ NO ₂ p-Nitrotoluene (136) ¹		
63.98	0.8179	39.76	0.9417	517. B = C ₇ H ₈ (2, 102) (0–100 Wt. % B)(±0.25%)		
74.81	0.8080	32.81	0.9625	$d_4^{13} = (0.799 + 0.03762$ × Wt. % B)		
89.51	0.7948	25.75	0.9837	$d_4^{16} = (0.797 + 0.03731$ × Wt. % B)		
100.00	0.7862	19.24	1.0022	$d_4^{22} = (0.788 + 0.03727$ × Wt. % B)		
(±0.1%)(355)			12.02	518. B = C ₇ H ₈ O ₆ Gallic acid monohydrate (296) ^{1,2}		
Wt. % B	d_4^{30}	7.19	1.0378	519. B = C ₇ H ₁₄ O ₂ Amyl acetate (69) ¹		
0.00	0.7810	0.00	1.0583	520. B = C ₈ H ₉ NO Acetanilide (292) ²		
21.24	0.7999	100.00	0.7561			
49.34	0.8227	90.43	0.7832			
72.14	0.8425	80.47	0.8118			
100.00	0.8677	72.30	0.8337			
513. B = C ₆ H ₆ O Phenol (±0.01%)(27)			62.58			
		55.33	0.8637			
		47.21	0.8847			
		39.76	0.9116			
		32.81	0.9317			
			0.9530			

C₃H₆O—(Continued)

531. B = C₁₂H₂₃IN
Tetrapropylammonium iodide
(330, 1 331¹)

532. B = C₁₃H₁₀O

Benzophenone

(±0.01%)(33)

Wt. % A	d_4^{30}
100.000	0.78117
96.446	0.79017
92.988	0.79881
89.305	0.80846

533. B = C₁₆H₃₂O₂

Palmitic acid (158)

534. B = C₁₈H₃₄O₂

Oleic acid

(0 – 100 Wt. % A)(38)

$d_4^{30} = (0.8859 -$

$0.03756 \times \text{Wt. \% A}) \pm 0.25\%$

535. B = C₁₈H₃₆O₂

Stearic acid (158, 296, 1, 2)

536. B = C₁₉H₂₂N₂O

Cinchonine (234)

537. B = C₂₀H₂₀O₆

Methyl di-*p*-toluylglycerate (87)

538. B = C₂₁H₂₂O₆

Ethyl di-*p*-toluylglycerate (87)

539. B = C₂₅H₂₃N₅O₇

Picryl cinchonine (234)

540. B = C₂₆H₂₆N₂O₂

Benzoyl cinchonine (234)

541. B = C₂₆H₂₃N₂O₃S

p-Toluenesulfonylcinchonine
(234)

v. also 10, 42, 83, 95, 143, 159,
189, 235, 240, 252, 312, 376,
1265, 1275, 1277.5, 1278

C₃H₆O₂

Propionic acid

542. B = C₆H₆

(±0.05%)(135)

Wt. % B	d_4^{16}
100.00	0.8842
84.97	0.8958
62.74	0.9183
0.00	0.9973

543. B = C₇H₈

(±0.05%)(135)

Wt. % B	d_4^{16}
100.00	0.8694
84.11	0.8856
70.03	0.9020
0.00	0.9973

544. B = C₁₀H₁₆O

Camphor (323, 342)

(to 50.96 Wt. % B)(100)

$d_4^{20} = (0.9948 - 0.032708$

$\times \text{Wt. \% B}) \pm 0.1\%$

v. also 167, 313

C₃H₆O₂

Ethyl formate

545. B = C₃H₆O₂

Methyl acetate

(0–100 Wt. % B)(23)

$d_4^{20} = (0.9175 +$

$0.03171 \times \text{Wt. \% B})$

$\pm 0.025\%$

546. B = C₄H₈O₂

Ethyl acetate

(±0.025%)(23)

Wt. % B	d_4^{20}
0.000	0.9175
23.580	0.9125
46.094	0.9083
71.740	0.9042
100.000	0.9001

547. B = C₆H₆ (199)¹

548. B = C₈H₁₀

Xylene (199)¹

v. also 1265

C₃H₆O₂

Methyl acetate

549. B = C₄H₇ClO₂

Ethyl chloroacetate (158)

550. B = C₄H₈O₂

Ethyl acetate (133)

$d_4^t =$

(±0.05%)(157)

0 Mol % B

0.9559(1 – 0.001247 t)

25 Mol % B

0.9500(1 – 0.001379 t)

50 Mol % B

0.9384(1 – 0.001278 t)

100 Mol % B

0.9230(1 – 0.001371 t)

(±0.025%)(23)

Wt. % B	d_4^{20}
0.000	0.9346
21.036	0.9258
44.555	0.9171
71.008	0.9084
100.000	0.9001

551. B = C₆H₄Br₂

p-Dibromobenzene (158)

552. B = C₆H₆ (35, 158, 199¹)

553. B = C₆H₁₂O₃

Paraldehyde (158)

554. B = C₈H₁₀

Xylene (199)¹

555. B = C₁₀H₈

Naphthalene (54, 1 158)

556. B = C₁₂H₁₀N₂

Azobenzene (158)

557. B = C₁₄H₁₀

Phenanthrene (158)

v. also 11, 377, 545, 1265

C₃H₇NO

Methylacetamide

558. B = C₅H₅N

Pyridine

(±0.05%)(70)

Wt. % B

d_4^{25}

100.00	0.9746
93.41	0.9786
88.80	0.9819
83.56	0.9844

C₃H₇NO

Propionamide

559. B = C₅H₅N

Pyridine

(to 23.75 Wt. % A)(70)

$d_4^{25} = (0.9746 +$

$0.00299 \times \text{Wt. \% A}) \pm 0.05\%$

560. B = C₆H₆ (180)

v. also 96, 378, 500

C₃H₇NO₂

Urethane

561. B = C₃H₈O

Propyl alcohol (299)¹

562. B = C₄H₁₀O

Ethyl ether (±0.01%)(261.1)

Wt. % A	d_4^{20}
0	0.7137
1	0.7167
2	0.7197
3	0.7227
4	0.7258
5	0.7289
10	0.7442
20	0.7754
30	0.8083
40	0.8430

563. B = C₅H₅N

Pyridine

(±0.05%)(70)

Wt. % B	d_4^{25}
100.00	0.9746
90.91	0.9832
85.04	0.9899

564. B = C₆H₆ ±0.01%(261.1)

Wt. % A	d_4^{20}
0	0.8784
1	0.8800
2	0.8815
3	0.8831
4	0.8846
5	0.8862
10	0.8942

565. B = C₇H₈ (299)^{1,2}

v. also 97, 190, 379

C₃H₈O

Propyl alcohol

566. B = C₃H₈O₃

Glycerol (200)¹

567. B = C₄H₆O₅

Malic acid (194)¹

568. B = C₄H₁₀O

Ethyl ether

(±0.025%)(9)

Wt. % B	d_4^{25}
0.00	0.8012
10.93	0.7920
22.99	0.7820
34.92	0.7732

Wt. % B

d_4^{25}

47.16	0.7596
59.89	0.7477
72.97	0.7345
86.22	0.7204
100.00	0.7079

569. B = C₆H₆ (133, 233, 1 238, 1 351)

570. B = C₆H₇N

Aniline

$t_4 =$

(±0.05%)(157)

100.0 Mol % B

1.0415(1 – 0.03844 t)

65.0 Mol % B

0.9798(1 – 0.03878 t)

20.3 Mol % B

0.8856(1 – 0.001014 t)

0.0 Mol % B

0.8210(1 – 0.001024 t)

571. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(203, 288)

a | 10³b

(20°–69.6°)

0.00 Wt. % B

0.8041 | 0.840 ($t - 20$)

(16.6°–32.5°)

2.50 Wt. % B

0.8148 | 0.811 ($t - 16.6$)

(16.7°–80.2°)

5.00 Wt. % B

0.8212 | 0.865 ($t - 16.7$)

(23.5°–79.6°)

7.71 Wt. % B

0.8238 | 0.844 ($t - 23.5$)

(17.7°–70.6°)

25.00 Wt. % B

0.8811 | 0.899 ($t - 17.7$)

(19.8°–80.2°)

49.83 Wt. % B

0.9678 | 0.958 ($t - 19.8$)

(21°–71.2°)

74.99 Wt. % B

1.0746 | 0.995 ($t - 21$)

572. B = C₁₀H₈

Naphthalene (299)¹

573. B = C₁₀H₁₄N₂

Nicotine (110, 341)

574. B = C₁₀H₁₆O

Camphor (323, 342)

(±0.1%)(100)

Wt. % B	d_4^{20}
0.00	0.8046
12.19	0.8210
23.90	0.8380
35.10	0.8543
45.93	0.8709
56.37	0.8874

575. B = C₁₂H₁₀

Acenaphthene (299)¹

v. also 43, 84, 160, 168, 191,
276, 381, 497, 561

C₃H₈O₂ Methylal <i>v.</i> 44		0 Mol % B 1.4126(1 - 0.001016 <i>t</i>) 25 Mol % B 1.3217(1 - 0.001059 <i>t</i>) 50 Mol % B 1.2141(1 - 0.001132 <i>t</i>) 75 Mol % B 1.0839(1 - 0.001200 <i>t</i>) 100 Mol % B 0.9230(1 - 0.001371 <i>t</i>)		Mol % A 100 55 52 50 48 45 10 0 0.9537 1.0450 1.0457 1.0451 1.0337 1.0249 0.8526 0.8035		C₄H₆O₅ Malic acid <i>v.</i> 196, 386, 503, 567	
C₃H₈O₃ Glycerol 576. B = C ₄ H ₆ O ₄ Succinic acid (116) ^{1,2}		580. B = C ₄ H ₁₀ O Ethyl ether (158)		589. B = C ₇ H ₉ N Methylaniline (±0.05 %)(165)		C₄H₆O₆ Tartaric acid 591. B = C ₄ H ₁₀ O Ethyl ether (296) ^{1,2}	
577. B = C ₅ H ₁₂ O Isoamyl alcohol (200) ¹		581. B = C ₆ H ₅ NO ₂ Nitrobenzene (158)		Mol % A 100 90 75 60 52 50 48 45 40 25 10 0 1.0124 1.0362 1.0586 1.0845 1.0970 1.0978 1.0929 1.0821 1.0703 1.0294 1.0282 0.9841		592. B = C ₅ H ₁₂ O Isoamyl alcohol (296) ^{1,2}	
578. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.01 %)(131)		582. B = C ₆ H ₆ (158)		d ₄ ²⁵ 1.0124 1.0362 1.0586 1.0845 1.0970 1.0978 1.0929 1.0821 1.0703 1.0294 1.0282 0.9841		593. B = C ₆ H ₆ (296) ^{1,2} <i>v. also</i> 12, 387	
Wt. % B 100.000 86.833 77.577 68.038 60.224 54.263 47.663 42.513 37.676 0.000 (±0.05 %)(203, 288, 344)		583. B = C ₆ H ₁₄ Hexane (158)		Mol % A 100 90 75 60 52 50 48 45 40 25 10 0 0.9885 1.0170 1.0346 1.0620 1.0677 1.0770 1.0723 1.0697 1.0508 1.0093 0.9857 0.9634		C₄H₇ClO₂ Ethyl chloroacetate 594. B = C ₄ H ₈ O ₂ Ethyl acetate (158)	
d ₄ ¹⁵ 1.20990 1.22034 1.22674 1.23262 1.23693 1.24028 1.24376 1.24636 1.24869 1.26396		584. B = C ₈ H ₈ O ₂ Methyl benzoate (158)		595. B = C ₅ H ₁₀ O ₂ Methyl butyrate (158)		596. B = C ₆ H ₄ Br ₂ <i>p</i> -Dibromobenzene (158)	
a (13.2°-99.5°) 0.00 Wt. % B 1.2647 | 0.642(<i>t</i> - 13.2) (17.1°-99°) 4.99 Wt. % B 1.2616 | 0.664(<i>t</i> - 17.1) (17.3°-99.5°) 9.91 Wt. % B 1.2597 | 0.678(<i>t</i> - 17.3) (8.5°-100°) 23.46 Wt. % B 1.2596 | 0.717(<i>t</i> - 8.5) (10°-100°) 48.13 Wt. % B 1.2478 | 0.812(<i>t</i> - 10) (19°-100°) 69.93 Wt. % B 1.2287 | 0.882(<i>t</i> - 19) (8°-100°) 89.98 Wt. % B 1.2269 | 0.972(<i>t</i> - 8) (16.8°-99.4°) 100.00 Wt. % B 1.2085 | 1.016(<i>t</i> - 16.8)		585. B = C ₁₄ H ₁₀ Phenanthrene (158)		597. B = C ₆ H ₆ (158)		598. B = C ₆ H ₁₀ O ₃ Ethyl acetoacetate (158)	
10 ³ b 1.26396 (±0.05 %)(203, 288, 344)		<i>v. also</i> 277, 340		599. B = C ₆ H ₁₄ Hexane (158)		600. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (158)	
C₄H₅NO₂ Methyl cyanoacetate 586. B = C ₈ H ₂₀ IN Tetraethylammonium iodide (330) ¹		C₄H₅NO₂ Succinimide <i>v.</i> 383		601. B = C ₇ H ₁₄ O ₂ Propyl butyrate (158)		602. B = C ₈ H ₈ O ₂ Methyl benzoate (158)	
<i>v. also</i> 501		C₄H₅NS Allyl thiocyanate 587. B = C ₅ H ₅ N Pyridine (165) ¹		603. B = C ₁₀ H ₈ Naphthalene (158)		604. B = C ₁₀ H ₁₆ O <i>d</i> -Camphor (14.23-54.22 Wt. % B)(170) d ₄ ²⁰ = (1.1224 - 0.0021 (Wt. % B - 14.23)) ±0.1 %	
C₄H₅NO₂ Succinimide <i>v.</i> 383		588. B = C ₅ H ₁₁ N Piperidine (±0.05 %)(165)		C₄H₆O₃ Acetic anhydride 590. B = C ₆ H ₁₂ O ₃ Paraldehyde (±0.075 %)(68, 150)		605. B = C ₁₂ H ₁₀ N ₂ Azobenzene (158)	
Mol % A 100 90 75 60 55 52 50 48 45 40 25 10 0 1.0125 1.0200 1.0692 1.0768 1.0813 1.0818 1.0804 1.0708 1.0571 1.0382 0.9728 0.9032 0.8565		Mol % A 100 55 52 50 48 45 0 0.9885 1.0638 1.0666 1.0668 1.0577 1.0447 0.8338		Wt. % A 100.00 90.00 70.04 50.00 30.01 9.98 0.00 1.0897 1.0813 1.0633 1.0474 1.0309 1.0104 1.0037		606. B = C ₁₄ H ₁₀ Phenanthrene (158)	
<i>v. also</i> 192, 382, 566, 1274		C₄H₆O₃ Acetic anhydride 590. B = C ₆ H ₁₂ O ₃ Paraldehyde (±0.075 %)(68, 150)		Wt. % A 100.00 90.00 70.04 50.00 30.01 9.98 0.00 1.0096 1.0019 0.9860 0.9702 0.9533 0.9367 0.9248		607. B = C ₁₈ H ₃₆ O ₂ Stearic acid (158)	
C₄H₂O₄ Acetylene dicarboxylic acid <i>v.</i> 193		<i>v. also</i> 314		C₄H₈O Methyl ethyl ketone <i>v.</i> 505		C₄H₈O₂ Butyric acid 608. B = C ₅ H ₈ N Pyridine (±0.25 %)(312)	
C₄H₄O₄ Fumaric acid <i>v.</i> 194		Mol % B 100.0 81.8 64.2 52.8 42.9 25.6 15.2 0.0 0.976 0.982 0.988 0.993 0.998 0.991 0.984 0.965		C₄H₆O₄ Succinic acid <i>v.</i> 195, 385, 502, 576		Mol % B 100.0 81.8 64.2 52.8 42.9 25.6 15.2 0.0 0.976 0.982 0.988 0.993 0.998 0.991 0.984 0.965	
C₄H₅Cl₃O₂ Ethyl trichloroacetate 579. B = C ₄ H ₈ O ₂ Ethyl acetate (158) d ₄ ¹ = (±0.05 %)(157)		Mol % B 100.0 81.8 64.2 52.8 42.9 25.6 15.2 0.0 0.976 0.982 0.988 0.993 0.998 0.991 0.984 0.965		Mol % B 100.0 81.8 64.2 52.8 42.9 25.6 15.2 0.0 0.976 0.982 0.988 0.993 0.998 0.991 0.984 0.965		Mol % B 100.0 81.8 64.2 52.8 42.9 25.6 15.2 0.0 0.976 0.982 0.988 0.993 0.998 0.991 0.984 0.965	

C₄H₈O₂.—(Continued)609. B = C₆H₆(±0.05%)(¹³⁵)

Wt. % B	d_4^{16}
100.00	0.8842
93.97	0.8866
65.81	0.9059
0.00	0.9633

610. B = C₇H₈(±0.05%)(¹³⁵)

Wt. % B	d_4^{16}
100.00	0.8694
90.23	0.8771
64.09	0.8996
0.00	0.9633

611. B = C₁₀H₁₆OCamphor (³²³, ³⁴²)*v. also* 169, 197, 315, 388**C₄H₈O₂**

Isobutyric acid

612. B = C₆H₆ (²³³)¹*v. also* 45**C₄H₈O₂**

Ethyl acetate

613. B = C₄H₈O₂

Propyl formate

(to 40°)(±0.025%)(²⁴)

a	10 ³ b
100.00 Wt. % A	
0.92425	1.218 t
49.754 Wt. % A	
0.92360	1.183 t
0.00 Wt. % A	
0.92335	1.153 t

614. B = C₅H₅N

Pyridine

(to 55°)(±0.025%)(¹⁷⁸)

50 Wt. % A

a	10 ³ b
0.9573	1.071 t

615. B = C₅H₁₀O₂

Isobutyl formate

(to 40°)(±0.025%)(²⁴)

a	10 ³ b
100.00 Wt. % A	
0.92425	1.218 t
54.886 Wt. % A	
0.91535	1.145 t
0.00 Wt. % A	
0.90660	1.075 t

616. B = C₅H₁₀O₂Ethyl propionate (³⁵¹, ³⁵²)¹617. B = C₆H₄Br₂*p*-Dibromobenzene (¹⁵⁸)(±0.005%)(³¹⁸)

Wt. % B	d_4^{25}
0.000	0.89450
3.165	0.91100
5.302	0.92152
7.100	0.93073
12.355	0.95939
20.100	1.00447

618. B = C₆H₄N₂O₄*m*-Dinitrobenzene (¹⁵⁸)(±0.005%)(⁴⁷, ¹⁸⁷)

Wt. % A	d_4^{30}
100.00	0.88894
74.25	0.99199
72.36	1.00014
69.15	1.01473
68.14	1.01935
67.40	1.02287
65.78	1.03021
65.56	1.03118
60.86	1.05349
56.79	1.07333
0.00	1.56563

(±0.025%)(³¹⁸)a | 10³b

(15°–70°)

100.00 Wt. % A

0.90728 | 1.259(t – 15)

(20°–60°)

96.411 Wt. % A

0.91366 | 1.232(t – 20)

(15°–60°)

93.971 Wt. % A

0.92868 | 1.226(t – 15)

(20°–60°)

85.831 Wt. % A

0.95438 | 1.206(t – 20)619. B = C₆H₅NO₂Nitrobenzene (¹⁵⁸)(±0.075%)(¹²²)

Wt. % A	d_4^{20}
0.00	1.2034
15.00	1.1500
29.24	1.1023
36.57	1.0780
55.55	1.0193
79.98	0.9499
92.02	0.9191
100.00	0.8976

(±0.0075%)(¹⁷¹)

Wt. % A	d_4^{25}
0.000	1.19824
24.466	1.11280
43.892	1.05007
77.100	0.95398
100.000	0.89415

(50 Wt. % A)(±0.025%)(¹⁷⁸)t | d_4^t

0 | 1.0578

25 | 1.0303

40 | 1.0135

55 | 0.9970

70 | 0.9791

620. B = C₆H₆ (¹²², ¹⁴², ¹⁵⁸, ¹⁷⁶, ²⁶³)¹(±0.0075%)(¹⁷¹)

Wt. % B	d_4^{25}
0.000	0.89415
15.594	0.89036
51.404	0.88262
80.803	0.87738
100.000	0.87420

(±0.025%)(¹⁷⁸)

50 Wt. % B

a	10 ³ b
0.9105	1.2 t

621. B = C₆H₆O₂
Resorcinol (⁴⁹)
0–100 Wt. % B
 $\frac{1}{d_4^{30}} = [1.12616 -$
0.0242025 Wt. % B +
0.0412997(Wt. % B)² –
0.07264(Wt. % B)³](±0.005%)

622. B = C₆H₇N

Aniline

(±0.25%)(³⁴⁵)

Mol % B	d_4^0
100.0	1.034
93.9	1.033
88.9	1.028
85.5	1.024
84.2	1.022
77.6	1.015
74.9	1.012
67.2	1.004
50.8	0.985
42.8	0.978
22.3	0.952
15.2	0.944
0.0	0.923

Mol % B	d_4^{-9}
0.0	0.932
27.0	0.966
78.0	1.210

Mol % B	d_4^{-10}
0.0	0.933
14.4	0.955
20.0	0.960

Mol % B	$d_4^{-19.5}$
45.1	1.012
27.0	0.976
0.0	0.941

623. B = C₆H₁₀O₈

Citric acid monohydrate

(296)^{1,2}624. B = C₆H₁₂O₃Paraldehyde (¹⁵⁸)625. B = C₆H₁₄Hexane (¹⁵⁸)626. B = C₇H₈Toluene (¹⁵⁸)(±0.0075%)(¹⁷¹)

Wt. % A	d_4^{25}
100.000	0.88909
84.292	0.88342
54.699	0.87292
28.745	0.86401
0.000	0.85448

627. B = C₇H₃O₆

Gallic acid monohydrate

(296)^{1,2}628. B = C₇H₁₄O₂Isoamyl acetate (⁹⁹, ¹³³) $d_4^t =$ (±0.05%)(¹⁵⁷)

0 Mol % B

0.9230(1 – 0.001710 t)

51 Mol % B

0.9005(1 – 0.001176 t)

100 Mol % B

0.8864(1 – 0.001087 t)629. B = C₈H₅O₂Methyl benzoate (¹⁵⁸)630. B = C₈H₁₀

Ethyl benzene

(to 40°)(±0.025%)(²⁴)a | 10³b

100 Wt. % A

0.92425 | 1.218 t

54.969 Wt. % A

0.90635 | 1.033 t

0.00 Wt. % A

0.89130 | 0.886 t 631. B = C₈H₁₁N

Dimethylaniline

(±0.075%)(¹²²)

Wt. % A	d_4^{20}
100.00	0.8977
90.64	0.9038
81.57	0.9097
60.11	0.9215
49.92	0.9319
22.68	0.9431
9.93	0.9503
0.00	0.9558

632. B = C₈H₁₄O₄

Ethyl succinate

 $d_4^t =$ (±0.05%)(¹⁵⁷)

0 Mol % A

1.0607(1 – 0.03978 t)

10 Mol % A

1.0534(1 – 0.03969 t)

25 Mol % A

1.0301(1 – 0.021026 t)

37.5 Mol % A

1.0294(1 – 0.021041 t)

50 Mol % A

1.0171(1 – 0.021032 t)

75 Mol % A

0.9816(1 – 0.021179 t)

100 Mol % A

0.9230(1 – 0.021371 t)633. B = C₉H₁₀O₂

Ethyl benzoate

(±0.1%)(¹⁵²)

Mol % A	d_4^{25}
100.00	0.8948
89.92	0.9204
79.77	0.9440
69.89	0.9598
59.98	0.9740
50.44	0.9866
39.73	0.9992
31.31	1.0101
20.88	1.0223
12.16	1.0320
0.00	1.0431

$d_4^t =$ ($\pm 0.05\%$)(157)	
0 Mol % A	
1.0648(1 - 0.03856t)	
25 Mol % A	
1.0458(1 - 0.03893t)	
50 Mol % A	
1.0329(1 - 0.03964t)	
75 Mol % A	
0.9726(1 - 0.021104t)	
100 Mol % A	
0.9230(1 - 0.021371t)	
634. B = C ₁₀ H ₈	
Naphthalene (158)	
(to 2.808 Wt. % B)(54)	
$d_4^{25} = (0.90299 + 0.001321$	
Wt. % B) $\pm 0.0075\%$	
635. B = C ₁₀ H ₁₄	
Durene	
(to 12.531 Wt. % B)(318)	
$d_4^{25} = (0.89450 - 0.031979$	
Wt. % B) $\pm 0.005\%$	
636. B = C ₁₀ H ₁₅ BrO	
Bromocamphor	
($\pm 0.1\%$)(235)	
Wt. % A	d_4^{25}
100.00	0.8947
99.54	0.8959
95.61	0.9083
79.24	0.9630
68.11	1.0031
61.10	1.0286
637. B = C ₁₀ H ₁₆ O	
d-Camphor	
(to 50 Wt. % B)(170, 175, 263)	
$d_4^{20} = (0.8966 + 0.03672$	
Wt. % B)	
$\pm 0.1\%$	
(to 51.69 Wt. % B)(235)	
$d_4^{25} = (0.8948 + 0.0365$	
Wt. % B)	
$\pm 0.1\%$	
638. B = C ₁₀ H ₂₂ O	
Isoamyl ether	
($\pm 0.05\%$)(157)	
$d_4^t =$	
0 Mol % A	
0.8048(1 - 0.021017t)	
25 Mol % A	
0.8210(1 - 0.021056t)	
50 Mol % A	
0.8413(1 - 0.021096t)	
75 Mol % A	
0.8737(1 - 0.021202t)	
100 Mol % A	
0.9230(1 - 0.021371t)	
639. B = C ₁₂ H ₁₀	
Acenaphthene (158)	
($\pm 0.005\%$)(318)	
Wt. % A	d_4^{25}
100.000	0.89450
96.368	0.90103
93.439	0.90642
89.090	0.91389

640. B = C ₁₂ H ₁₀	
Diphenyl (158)	
(to 17.194 Wt. % B)(318)	
$d_4^{25} = (0.89450 + 0.021382$	
Wt. % B) $\pm 0.005\%$	
641. B = C ₁₂ H ₁₀ N ₂	
Azobenzene (158)	
642. B = C ₁₂ H ₂₈ IN	
Tetrapropylammonium iodide	
(330) ¹	
643. B = C ₁₄ H ₈ O ₂	
Phenanthraquinone (297, ¹	
3171.2)	
644. B = C ₁₄ H ₁₀	
Phenanthrene (158)	
($\pm 0.025\%$)(318)	
a	10 ^{3b}
(15°-70°)	
100.000 Wt. % A	
0.90728	1.259(t - 15)
(15°-60°)	
93.526 Wt. % A	
0.91550	1.1213(t - 15)
91.616 Wt. % A	
0.92353	1.188(t - 15)
(20°-70°)	
84.152 Wt. % A	
0.93231	1.142(t - 20)
645. B = C ₁₄ H ₁₀ O ₂	
Benzil (158)	
($\pm 0.005\%$)(318)	
Wt. % A	d_4^{25}
100.000	0.89450
98.006	0.89911
95.775	0.90415
93.009	0.91066
84.862	0.92978
646. B = C ₁₄ H ₁₂ O ₂	
Benzyl benzoate ($\pm 0.1\%$)(152)	
Mol % A	d_4^{25}
100.00	0.8948
89.80	0.9394
79.90	0.9720
69.73	0.9988
58.63	1.0247
50.00	1.0454
40.01	1.0625
30.02	1.0778
23.47	1.0867
14.26	1.0975
7.84	1.1048
0.00	1.1121
647. B = C ₁₆ H ₃₂ O ₂	
Palmitic acid (158)	
648. B = C ₁₈ H ₃₆ O ₂	
Stearic acid (158, 2961.2)	
649. B = C ₁₉ H ₁₆	
Triphenylmethane (158)	
($\pm 0.005\%$)(318)	
Wt. % A	d_4^{25}
100.000	0.89450
98.222	0.89764
93.655	0.90481
90.506	0.90981

<i>v. also</i> 13, 46, 161, 236, 316, 342,	
362, 389, 546, 550, 579, 594,	
1265, 1279	
C ₄ H ₈ O ₂	
Methyl propionate	
650. B = C ₆ H ₄ Br ₂	
<i>p</i> -Dibromobenzene (158)	
651. B = C ₆ H ₆ (158)	
652. B = C ₁₀ H ₈	
Naphthalene (158)	
653. B = C ₁₂ H ₁₀ N ₂	
Azobenzene (158)	
C ₄ H ₈ O ₂	
Propyl formate	
654. B = C ₅ H ₁₀ O ₂	
Isobutyl formate	
(0°-40°)($\pm 0.025\%$)(24)	
a	10 ^{3b}
0 Wt. % B	
0.9234	1.153t
46.265 Wt. % B	
0.9149	1.114t
100.00 Wt. % B	
0.9066	1.075t
<i>v. also</i> 613	
C ₄ H ₈ O ₃	
Methyl <i>L</i> -lactate	
655. B = C ₆ H ₅ NO ₂	
Nitrobenzene	
($\pm 0.05\%$)(211)	
a	10 ^{3b}
(-75° to +125°)	
0 Wt. % B	
1.2040	1.158(t + 75)
(16°-141°)	
90.12 Wt. % B	
1.1918	1.000(t - 16)
<i>v. also</i> 253	
C ₄ H ₉ NO	
Butyramide	
<i>v.</i> 390	
C ₄ H ₉ NO ₂	
Methylurethane	
656. B = C ₁₀ H ₂₀ O	
Menthol	
(55.6°-99°)($\pm 0.25\%$)(273)	
a	10 ^{3b}
0.00 Mol % B	
1.136	1.060(t - 55.6)
14.12 Mol % B	
1.027	0.945(t - 55.6)
38.72 Mol % B	
0.961	0.853(t - 55.6)
58.13 Mol % B	
0.923	0.829(t - 55.6)
72.21 Mol % B	
0.904	0.898(t - 55.6)
85.50 Mol % B	
0.884	0.807(t - 55.6)
100.00 Mol % B	
0.869	0.737(t - 55.6)

C ₄ H ₁₀ O	
<i>n</i> -Butyl alcohol	
657. B = C ₆ H ₆ (238) ¹	
658. B = C ₁₀ H ₁₂	
Tetrahydronaphthalene	
($\pm 0.075\%$)(121)	
Wt. % A	d_4^{25}
100.00	0.8037
71.66	0.8441
42.87	0.8878
28.70	0.9105
15.10	0.9335
0.00	0.9656
659. B = C ₁₀ H ₁₈	
Decahydronaphthalene	
($\pm 0.075\%$)(121)	
Wt. % A	d_4^{25}
100.00	0.8037
67.62	0.8262
50.57	0.8385
32.88	0.8520
17.41	0.8640
10.20	0.8702
0.00	0.8790
C ₄ H ₁₀ O	
Isobutyl alcohol	
660. B = C ₆ H ₅ NO ₂	
Nitrobenzene (192, 328)	
661. B = C ₆ H ₆ (233, ¹ 351)	
662. B = C ₇ H ₅ N	
Cyanobenzene (192, 328)	
663. B = C ₈ H ₁₄ O ₆	
Ethyl tartrate (235, ¹ 340, ¹ 343) ¹	
($\pm 0.1\%$)(204, 288)	
a	10 ^{3b}
(16.9°-83.7°)	
100.00 Wt. % A	
0.8053	0.854(t - 16.9)
(18.5°-80.1°)	
95.00 Wt. % A	
0.8174	0.854(t - 18.5)
(19.7°-83.4°)	
90.00 Wt. % A	
0.8311	0.863(t - 19.7)
(14.7°-77.2°)	
75.00 Wt. % A	
0.8812	0.896(t - 14.7)
(16°-77.6°)	
49.99 Wt. % A	
0.9683	0.941(t - 16)
(17.4°-82.8°)	
37.16 Wt. % A	
1.0198	0.971(t - 17.4)
(18.4°-78.8°)	
24.97 Wt. % A	
1.0738	0.986(t - 18.4)
(16.8°-99.4°)	
0.00 Wt. % A	
1.2085	1.016(t - 16.8)
664. B = C ₁₀ H ₁₄ N ₂	
Nicotine (343) ¹	

C₄H₁₀O—(Continued)665. B = C₁₀H₁₆O

Camphor (323, 342)

(±0.1%)(235)

Wt. % A	d_4^{25}
100.00	0.7994
99.02	0.8007
95.06	0.8065
76.02	0.8330
53.85	0.8666
43.35	0.8825

666. B = C₁₀H₁₈O₆

Dipropyl tartrate

(20°–60°)(±0.1%)(340)

a | 10³b

0.00 Wt. % A	
1.1389 | 0.9050(<i>t</i> – 20)	
21.21 Wt. % A	
1.0492 | 0.9125(<i>t</i> – 20)	
41.24 Wt. % A	
0.9750 | 0.8800(<i>t</i> – 20)	
59.15 Wt. % A	
0.9172 | 0.8425(<i>t</i> – 20)	
76.84 Wt. % A	
0.8645 | 0.8200(<i>t</i> – 20)	
84.69 Wt. % A	
0.8449 | 0.8100(<i>t</i> – 20)	

v. also 47, 170, 198, 391

C₄H₁₀O

Trimethylcarbinol

667. B = C₆H₆O

Phenol

(±0.075%)(232)

Wt. % B	d_4^{25}
79.63	1.0032
49.25	0.9105
29.23	0.8571
24.87	0.8442
0.00	0.7825

Wt. % B	d_4^{46}
100.00	1.0455
79.63	0.9852
49.25	0.8918
29.23	0.8375
24.87	0.8238
0.00	0.7561

C₄H₁₀O

Ethyl ether

668. B = C₆H₁₀

Amylene (103)

669. B = C₅H₁₂

Pentane (61)

670. B = C₆H₄Br₂*p*-Dibromobenzene (158)

(±0.005%)(318)

Wt. % B	d_4^{25}
0.000	0.70803
2.712	0.72129
7.492	0.74567
7.801	0.74708
15.710	0.79138

671. B = C₆H₅NO₂

Nitrobenzene

(±0.05%)(107)

Wt. % A	d_4^{20}
0.00	1.2037
10.35	1.1340
20.21	1.0729
34.34	0.9946
48.85	0.9212
65.87	0.8430
84.21	0.7710
100.00	0.7132

672. B = C₆H₆ (32, 135, 59, 1

61, 95, 103, 158, 171, 1

240, 280, 1282, 13551)

(to 40°)(±0.0075%)(101)

$$\frac{1}{d_4^t} =$$

0.000 Wt. % B	
1.35729(1 + 0.0 ₂ 15006 <i>t</i>	
+ 0.0 ₅ 4370 <i>t</i> ²)	
16.294 Wt. % B	
1.31370(1 + 0.0 ₂ 14371 <i>t</i>	
+ 0.0 ₅ 3355 <i>t</i> ²)	
29.813 Wt. % B	
1.27993(1 + 0.0 ₂ 13536 <i>t</i>	
+ 0.0 ₅ 3660 <i>t</i> ²)	
51.087 Wt. % B	
1.22752(1 + 0.0 ₂ 12790 <i>t</i>	
+ 0.0 ₅ 2570 <i>t</i> ²)	
69.739 Wt. % B	
1.18308(1 + 0.0 ₂ 12260 <i>t</i>	
+ 0.0 ₅ 2380 <i>t</i> ²)	
84.946 Wt. % B	
1.14745(1 + 0.0 ₂ 11965 <i>t</i>	
+ 0.0 ₅ 1850 <i>t</i> ²)	
100.00 Wt. % B	
1.11235(1 + 0.0 ₂ 11715 <i>t</i>	
+ 0.0 ₅ 155 <i>t</i> ²)	

673. B = C₆H₇N

Aniline

(±0.05%)(107)

Wt. % B	d_4^{20}
100.00	1.0220
85.46	0.9732
69.22	0.9210
55.55	0.8785
45.80	0.8487
44.15	0.8437
37.81	0.8247
28.23	0.7961
19.62	0.7705
0.00	0.7131

674. B = C₆H₈O₇Citric acid (296)^{1,2}675. B = C₆H₁₀O₈Citric acid monohydrate (296)^{1,2}676. B = C₇H₆O₂

Benzoic acid (296, 1, 2 303)

677. B = C₇H₆O₃

Salicylic acid (296, 1, 2 303)

678. B = C₇H₈

Toluene

(15°–35°)(±0.05%)(95)

a | 10³b

71.30 Wt. % A

0.7628 | 1.10(*t* – 15)

45.25 Wt. % A

0.8012 | 0.99(*t* – 15)

21.60 Wt. % A

0.8388 | 1.16(*t* – 15)679. B = C₇H₈O

Benzyl alcohol (10)

680. B = C₇H₈O₆Gallic acid monohydrate (296)^{1,2}681. B = C₈H₈O₂

Methyl benzoate (158)

682. B = C₈H₁₀O

Phenetole

(±0.1%)(152)

Mol % A	d_4^{25}
100.00	0.7139
90.04	0.7458
83.03	0.7656
75.85	0.7891
68.82	0.8059
60.48	0.8283
55.79	0.8387
51.06	0.8488
45.01	0.8628
35.16	0.8853
30.26	0.8970
25.23	0.9083
18.55	0.9230
9.75	0.9427
7.45	0.9471
0.00	0.9618

683. B = C₁₀H₇Br α -Bromonaphthalene (61)684. B = C₁₀H₈

Naphthalene (54, 158, 303)

(±0.005%)(85)

Wt. % A	d_4^{18}
100.000	0.71640
94.759	0.73043
90.167	0.74298
84.903	0.75747
80.088	0.77094
74.490	0.78699
70.342	0.79939

685. B = C₁₀H₁₄N₂

Nicotine (110, 341)

686. B = C₁₀H₁₆O*d*-Camphor (53)687. B = C₁₀H₁₆O₄Camphoric acid (296)^{1,2}688. B = C₁₀H₁₇Cl

Pinene hydrochloride (53)

(9.11–63.26 Wt. % B)

 $d_4^{15} = (0.735 + 0.0₂2825$

(Wt. % B – 9.11)) ±0.5%

689. B = C₁₂H₁₀

Acenaphthene (158)

(±0.005%)(318)

Wt. % A

 d_4^{25}

100.000	0.70803
96.189	0.71935
93.607	0.72723
92.521	0.73034

690. B = C₁₂H₁₀

Diphenyl

(±0.005%)(318)

Wt. % A	d_4^{25}
100.000	0.70803
97.886	0.71351
96.350	0.71759
91.945	0.72962
88.797	0.73904

691. B = C₁₂H₁₀N₂

Azobenzene (158)

(±0.005%)(318)

Wt. % B	d_4^{25}
0.000	0.70803
2.014	0.71366
5.831	0.72486
7.691	0.73336
16.592	0.75798

692. B = C₁₂H₁₀O

Diphenyl ether

(±0.1%)(152)

Wt. % A	d_4^{25}
100.00	0.7139
90.92	0.7601
78.26	0.8213
70.88	0.8554
60.76	0.8974
51.02	0.9311
42.35	0.9583
32.97	0.9862
21.93	1.0181
13.18	1.0387
7.04	1.0542
0.00	1.0706

693. B = C₁₄H₁₀

Phenanthrene (158)

694. B = C₁₄H₁₀O₂

Benzil (158)

(±0.005%)(318)

Wt. % A	d_4^{25}
100.000	0.70803
97.900	0.71475
95.182	0.72378
89.507	0.74309

695. B = C₁₆H₃₂O₂

Palmitic acid (158)

696. B = C₁₈H₃₄O₂

Oleic acid

(±0.25%)(38)

Wt. % A	d_4^{30}
0.00	0.8859
9.52	0.8690
24.55	0.8429
40.91	0.8118
53.29	0.7896
100.00	0.7010

697. B = C₁₈H₃₆O₂Stearic acid (296)^{1,2}

698. B = C ₁₉ H ₁₆ Triphenylmethane (158) (±0.005 %)(318)		C ₄ H ₁₂ ClN Diethylammonium chloride v. 99		Wt. % A 23.07 18.94 14.83 7.49 0.00		d ₄ ²⁰ 1.1961 1.2064 1.2175 1.2342 1.2508		Wt. % A 100.00 88.83 78.38 68.43 57.69		d ₄ ¹¹⁰ 0.8901 0.9199 0.9493 0.9770 1.0080	
Wt. % A 100.000 98.453 92.160		d ₄ ²⁵ 0.70803 0.71230 0.73048		Wt. % A 100.00 88.83 78.38 68.43 57.69		d ₄ ³⁰ 0.9723 0.9995 1.0267 1.0535 1.0842		48.52 39.85 32.53 27.50 23.07		1.0357 1.0621 1.0821 1.0941 1.1047	
698.5. B = Turpentine (±0.025 %)(123)		C ₄ H ₁₂ IN Tetramethylammonium iodide 700. B = C ₇ H ₆ O ₂ Salicylaldehyde (330) ¹		v. also 176, 200, 393, 489		1.1119 1.1191 1.1603 1.1741 1.1858		18.94 14.83 7.49 0.00		1.1138 1.1231 1.1375 1.1489	
Wt. % A 100.00 80.19 59.88 40.40 20.57 0.00		d ₄ ¹⁵ 0.7193 0.7465 0.7741 0.8015 0.8313 0.8617		C ₄ H ₁₂ N ₂ O ₃ Diethylammonium nitrate v. 100		1.1741 1.1858 1.1959 1.2062 1.2234 1.2397		703. B = C ₆ H ₅ NO ₂ o-Nitrophenol (±0.01 %)(28)		Wt. % A 100.00 88.68 79.26 72.42 60.38 47.75 39.76 31.68 23.21 13.04 8.75 0.00	
v. also 14, 48, 85, 98, 199, 237, 241, 254, 279, 302, 317, 343, 363, 392, 506, 562, 568, 580, 591, 1265, 1274		C ₅ H ₄ O ₂ , Furfural 701. B = C ₈ H ₂₀ IN Tetraethylammonium iodide (330) ¹		C ₅ H ₅ N Pyridine 702. B = C ₆ H ₅ ClO o-Chlorophenol (±0.01 %)(28)		d ₄ ⁴⁰ 0.9627 0.9896 1.0171 1.0441 1.0749 1.1026 1.1296 1.1507 1.1643 1.1757 1.1855 1.1956 1.2126 1.2282		d ₄ ³⁰ 0.9723 1.0047 1.0331 1.0543 1.0934 1.1361 1.1643 1.1927 1.2231 1.2574 1.2726 1.3041		Wt. % A 100.00 88.68 79.26 72.42 60.38 47.75 39.76 31.68 23.21 13.04 8.75 0.00	
C ₄ H ₁₁ N Diethylamine 699. B = C ₇ H ₅ NS Phenyl thiocyanate (±0.05 %)(165)		C ₅ H ₅ N Pyridine 702. B = C ₆ H ₅ ClO o-Chlorophenol (±0.01 %)(28)		Wt. % A 100.00 88.83 78.38 68.43 57.69 48.52 39.85 32.53 27.50 23.07 18.94 14.83 7.49 0.00		d ₄ ⁶⁰ 0.9425 0.9696 0.9976 1.0250 1.0560 1.0838 1.1109 1.1317 1.1446 1.1557 1.1652 1.1751 1.1913 1.2058		d ₄ ⁴⁰ 0.9627 0.9947 1.0231 1.0442 1.0830 1.1256 1.1535 1.1819 1.2123 1.2470 1.2618 1.2938		Wt. % A 100.00 88.68 79.26 72.42 60.38 47.75 39.76 31.68 23.21 13.04 8.75 0.00	
Mol % A 0.0 10.0 25.0 40.0 45.0 48.0 50.0 52.0 55.0 60.0 66.7 75.0 90.0 100.0		d ₄ ²⁵ 1.1287 1.1237 1.1167 1.1134 1.1113 1.1100 1.1090 1.0994 1.0874 1.0465 0.9959 0.9299 0.7888 0.7004		Wt. % A 100.00 88.83 78.38 68.43 57.69 48.52 39.85 32.53 27.50 23.07 18.94 14.83 7.49 0.00		d ₄ ¹⁰ 0.9916 1.0190 1.0459 1.0725 1.1029 1.1307 1.1578 1.1796 1.1939 1.2060 1.2169 1.2276 1.2451 1.2622		d ₄ ^{60.1} 0.9425 0.9740 1.0022 1.0232 1.0616 1.1036 1.1316 1.1597 1.1902 1.2248 1.2398 1.2708		Wt. % A 100.00 88.68 79.26 72.42 60.38 47.75 39.76 31.68 23.21 13.04 8.75 0.00	
Mol % A 0.0 10.0 25.0 40.0 45.0 48.0 50.0 52.0 55.0		d ₄ ³⁵ 1.1201 1.1134 1.1087 1.1051 1.1034 1.1027 1.1018 1.0925 1.0792 1.0382 0.9875 0.9208 0.7799 0.6894		Wt. % A 100.00 88.83 78.38 68.43 57.69 48.52 39.85 32.53 27.50 23.07 18.94 14.83 7.49 0.00		d ₄ ⁸⁰ 0.9819 1.0093 1.0364 1.0630 1.0936 1.1212 1.1485 1.1699 1.1841		d ₄ ⁸⁰ 0.9219 0.9536 0.9816 1.0025 1.0407 1.0823 1.1102		Wt. % A 100.00 88.68 79.26 72.42 60.38 47.75 39.76	
Mol % A 0.0 10.0 25.0 40.0 45.0 48.0 50.0 52.0 55.0		d ₄ ⁵⁰ 1.1060 1.1004 1.0958 1.0932 1.0921 1.0918 1.0909 1.0804 1.0677		Wt. % A 100.00 88.83 78.38 68.43 57.69 48.52 39.85 32.53 27.50		d ₄ ⁸⁰ 0.9819 1.0093 1.0364 1.0630 1.0936 1.1212 1.1485 1.1699 1.1841		d ₄ ⁸⁰ 0.9219 0.9536 0.9816 1.0025 1.0407 1.0823 1.1102		Wt. % A 100.00 88.68 79.26 72.42 60.38 47.75 39.76	

C₅H₅N.—(Continued)B = C₆H₅NO₃.—(Continued)

Wt. % A	d_4^{80}
31.68	1.1382
23.21	1.1684
13.04	1.2033
8.75	1.2183
0.00	1.2480

704. B = C₆H₆ (14)
(±0.05%)(73)

Wt. % B	d_4^{25}
100.00	0.8737
60.27	0.9144
40.65	0.9347
20.36	0.9556
10.23	0.9660
0.00	0.9783

705. B = C₆H₆O

Phenol

(±0.01%)(27)

Wt. % B	d_4^{10}
0.00	0.9916
17.26	1.0101
26.01	1.0196
35.14	1.0294
45.48	1.0412
51.89	1.0479
58.46	1.0543
66.99	1.0617
76.81	1.0699
82.86	1.0741
91.89	1.0786
100.00	1.0835

Wt. % B	d_4^{20}
0.00	0.9819
8.30	0.9916
16.12	1.0005
24.36	1.0096
32.58	1.0187
38.94	1.0258
47.13	1.0349
54.96	1.0429
63.81	1.0513
70.49	1.0567
77.94	1.0619
85.17	1.0667
92.45	1.0709
100.00	1.0751

Wt. % B	d_4^{30}
0.00	0.9723
8.30	0.9820
16.12	0.9909
24.36	1.0002
32.58	1.0096
38.94	1.0167
47.13	1.0260
54.96	1.0343
63.81	1.0426
70.49	1.0482
77.94	1.0533
85.17	1.0582
92.45	1.0624
100.00	1.0667

Wt. % B	d_4^{40}
0.00	0.9627
8.30	0.9724
16.12	0.9814
24.36	0.9909
32.58	1.0005
38.94	1.0077
47.13	1.0173
54.96	1.0257
63.81	1.0341
70.49	1.0397
77.94	1.0449
85.17	1.0498
92.45	1.0539
100.00	1.0583

Wt. % B	d_4^{60}
0.00	0.9425
8.30	0.9524
16.12	0.9620
24.36	0.9720
32.58	0.9821
38.94	0.9897
47.13	0.9995
54.96	1.0083
63.81	1.0168
70.49	1.0226
77.94	1.0279
85.17	1.0327
92.45	1.0369
100.00	1.0414

Wt. % B	d_4^{80}
0.00	0.9219
8.30	0.9325
16.12	0.9429
24.36	0.9532
32.58	0.9639
38.94	0.9718
47.13	0.9821
54.96	0.9910
63.81	0.9995
70.49	1.0053
77.94	1.0107
85.17	1.0155
92.45	1.0198
100.00	1.0242

Wt. % B	d_4^{110}
0.00	0.8901
8.30	0.9015
16.12	0.9120
24.36	0.9235
32.58	0.9348
38.94	0.9431
47.13	0.9535
54.96	0.9626
63.81	0.9719
70.49	0.9779
77.94	0.9833
85.17	0.9878
92.45	0.9923
100.00	0.9967

706. B = C₆H₇N
Aniline (267)¹
(0°–100°)(±0.25%)(79)

a	10 ³ b
100 Mol % B	

a	10 ³ b
1.033	0.800t
50 Mol % B	
1.025	0.885t
0 Mol % B	
1.001	0.964t

707. B = C₆H₁₀O₃
Ethyl acetoacetate
(±0.05%)(71)

Wt. % A	d_4^{25}
100.00	0.9782
82.89	0.9853
67.91	0.9916
49.00	0.9999
28.93	1.0091
0.00	1.0222

708. B = C₇H₆O₂

Benzoic acid

(±0.1%)(12)

Mol % A	d_4^{110}
100.0	0.8897
60.0	1.0122
50.0	1.0326
44.0	1.0455
38.0	1.0560
33.3	1.0626
28.0	1.0694
25.0	1.0713
18.0	1.0747

Mol % A	d_4^{125}
60.0	0.9999
50.0	1.0189
44.0	1.0325
38.0	1.0440
33.3	1.0494
28.0	1.0560
25.0	1.0581
18.0	1.0612
14.0	1.0698
8.0	1.0740
0.0	1.0769

Mol % A	d_4^{140}
50.0	1.0059
44.0	1.0182
38.0	1.0304
33.3	1.0362
28.0	1.0418
25.0	1.0447
18.0	1.0495
14.0	1.0560
8.0	1.0605

709. B = C₇H₇NO

Benzamide

(to 12.46 Wt. % B)(70)
 $d_4^{25} = (0.9746 + 0.021087$
Wt. % B) ± 0.05%710. B = C₇H₇NO

Formanilide

(to 19.14 Wt. % B)(70)
 $d_4^{25} = (0.9746 + 0.021537$
Wt. % B) ± 0.05%711. B = C₇H₈O

o-Cresol (±0.01%)(28)

Wt. % B	d_4^0
0.00	1.0013
12.05	1.0100
24.55	1.0197
33.60	1.0267
45.83	1.0364
55.91	1.0438
66.83	1.0513
77.73	1.0573
85.72	1.0605
91.85	1.0628
100.00	1.0653

Wt. % B	d_4^{10}
0.00	0.9916
12.05	1.0005
24.55	1.0104
33.60	1.0178
45.83	1.0279
55.91	1.0355
66.83	1.0430
77.73	1.0491
85.72	1.0521
91.85	1.0544
100.00	1.0567

Wt. % B	d_4^{20}
0.00	0.9819
12.05	0.9912
24.55	1.0012
33.60	1.0091
45.83	1.0196
55.91	1.0273
66.83	1.0348
77.73	1.0408
85.72	1.0439
91.85	1.0461
100.00	1.0483

Wt. % B	d_4^{30}
0.00	0.9723
12.05	0.9818
24.55	0.9928
33.60	1.0005
45.83	1.0112
55.91	1.0190
66.83	1.0265
77.73	1.0324
85.72	1.0356
91.85	1.0376
100.00	1.0399

Wt. % B	d_4^{40}
0.00	0.9627
12.05	0.9722
24.55	0.9835
33.60	0.9918
45.83	1.0026
55.91	1.0105
66.83	1.0180
77.73	1.0238
85.72	1.0270
91.85	1.0290
100.00	1.0312

Wt. % B	d_4^{50}
0.00	0.9425
12.05	0.9531
24.55	0.9653
33.60	0.9742
45.83	0.9855

Wt. % B	d_4^{60}
55.91	0.9937
66.83	1.0013
77.73	1.0070
85.72	1.0099
91.85	1.0117
100.00	1.0137
Wt. % B	d_4^{80}
0.00	0.9219
12.05	0.9341
24.55	0.9473
33.60	0.9565
45.83	0.9684
55.91	0.9767
66.83	0.9846
77.73	0.9901
85.72	0.9929
91.85	0.9946
100.00	0.9963
Wt. % B	d_4^{110}
0.00	0.8901
12.05	0.9041
24.55	0.9179
33.60	0.9277
45.83	0.9404
55.91	0.9491
66.83	0.9570
77.73	0.9623
85.72	0.9649
91.85	0.9664
100.00	0.9678

712. B = C₇H₈O*m*-Cresol(±0.1%)(²⁸)

Wt. % B	d_4^0
0.00	1.0013
14.09	1.0098
27.45	1.0181
41.40	1.0264
46.92	1.0296
55.33	1.0345
61.80	1.0377
70.62	1.0418
75.90	1.0439
85.17	1.0467
91.41	1.0479
100.00	1.0493
Wt. % B	d_4^{10}
0.00	0.9916
14.09	1.0003
27.45	1.0088
41.40	1.0175
46.92	1.0209
55.33	1.0260
61.80	1.0294
70.62	1.0336
75.90	1.0357
85.17	1.0385
91.41	1.0399
100.00	1.0413
Wt. % B	d_4^{20}
0.00	0.9819
14.09	0.9908
27.45	0.9995

Wt. % B	d_4^{20}
41.40	1.0086
46.92	1.0121
55.33	1.0174
61.80	1.0211
70.62	1.0254
75.90	1.0275
85.17	1.0303
91.41	1.0318
100.00	1.0333
Wt. % B	d_4^{30}
0.00	0.9723
14.09	0.9813
27.45	0.9902
41.40	0.9998
46.92	1.0033
55.33	1.0089
61.80	1.0128
70.62	1.0172
75.90	1.0193
85.17	1.0221
91.41	1.0237
100.00	1.0253
Wt. % B	d_4^{40}
0.00	0.9627
14.09	0.9718
27.45	0.9809
41.40	0.9909
46.92	0.9946
55.33	1.0003
61.80	1.0045
70.62	1.0089
75.90	1.0110
85.17	1.0139
91.41	1.0155
100.00	1.0173
Wt. % B	d_4^{60}
0.00	0.9425
14.09	0.9527
27.45	0.9630
41.40	0.9737
46.92	0.9778
55.33	0.9839
61.80	0.9882
70.62	0.9930
75.90	0.9951
85.17	0.9981
91.41	0.9997
100.00	1.0015
Wt. % B	d_4^{80}
0.00	0.9219
14.47	0.9344
26.75	0.9448
38.43	0.9545
50.72	0.9644
61.52	0.9721
70.94	0.9772
82.33	0.9817
90.88	0.9836
100.00	0.9853
Wt. % B	d_4^{110}
0.00	0.8901
14.47	0.9037
26.75	0.9155
38.43	0.9265
50.72	0.9376

Wt. % B	d_4^{110}
61.52	0.9456
70.94	0.9511
82.33	0.9555
90.88	0.9576
100.00	0.9594

713. B = C₇H₈O*p*-Cresol(±0.01%)(²⁸)

Wt. % B	d_4^0
0.00	1.0013
21.03	1.0145
29.61	1.0200
40.04	1.0265
46.71	1.0305
54.46	1.0351
60.37	1.0385
67.82	1.0419
75.36	1.0445
83.28	1.0464
91.01	1.0477
100.00	1.0487
Wt. % B	d_4^{10}
0.00	0.9916
21.03	1.0051
29.61	1.0108
40.04	1.0176
46.71	1.0219
54.46	1.0267
60.37	1.0302
67.82	1.0338
75.36	1.0365
83.28	1.0386
91.01	1.0400
100.00	1.0412
Wt. % B	d_4^{20}
0.00	0.9819
21.03	0.9957
29.61	1.0016
40.04	1.0087
46.71	1.0132
54.46	1.0182
60.37	1.0217
67.82	1.0254
75.36	1.0283
83.28	1.0306
91.01	1.0320
100.00	1.0335
Wt. % B	d_4^{30}
0.00	0.9723
21.03	0.9865
29.61	0.9926
40.04	1.0000
46.71	1.0046
54.46	1.0099
60.37	1.0133
67.82	1.0170
75.36	1.0200
83.28	1.0223
91.01	1.0239
100.00	1.0257
Wt. % B	d_4^{40}
0.00	0.9627
21.03	0.9773
29.61	0.9836

Wt. % B	d_4^{40}
40.04	0.9913
46.71	0.9962
54.46	1.0014
60.37	1.0048
67.82	1.0086
75.36	1.0117
83.28	1.0140
91.01	1.0159
100.00	1.0177
Wt. % B	d_4^{60}
0.00	0.9425
21.03	0.9592
29.61	0.9661
40.04	0.9744
46.71	0.9795
54.46	0.9850
60.37	0.9888
67.82	0.9927
75.36	0.9959
83.28	0.9984
91.01	1.0005
100.00	1.0026
Wt. % B	d_4^{80}
0.00	0.9219
14.06	0.9344
27.48	0.9463
41.10	0.9575
54.03	0.9679
63.11	0.9741
71.88	0.9792
81.72	0.9828
89.95	0.9850
100.00	0.9868
Wt. % B	d_4^{110}
0.00	0.8901
14.06	0.9038
27.48	0.9166
41.10	0.9292
54.03	0.9411
63.11	0.9475
71.88	0.9527
81.72	0.9566
89.95	0.9588
100.00	0.9604

714. B = C₈H₅NO₂

Phthalimide

(to 11.93 Wt. % B)(⁷⁰) $d_4^{25} = (0.9746 + 0.0263$

Wt. % B) ±0.05%

715. B = C₈H₁₄O₃

Ethyl ethylacetoacetate

(±0.05%)(⁷¹)

Wt. % A	d_4^{25}
100.00	0.9742
87.30	0.9743
59.38	0.9750
36.01	0.9755
14.67	0.9751
0.00	0.9750

C₅H₅N.—(Continued)716. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(209)

19.26 Wt. % B

<i>t</i>	<i>d</i> ₄ ^t
0.0	1.0410
13.8	1.0277
15.7	1.0262
43.6	0.9981
58.6	0.9878
66.3	0.9742
91.6	0.9477
100.0	0.9387

717. B = C₁₀H₈

Naphthalene

(to 3.113 Wt. % A)(54)

*d*₄¹⁸ = (0.97112 +

0.035915 Wt. % A) ± 0.0075%

718. B = C₁₀H₁₈O₃

Ethyl diethylacetoacetate

(±0.05%)(71)

Wt. % A	<i>d</i> ₄ ²⁵
100.00	0.9782
97.17	0.9781
93.09	0.9777
78.90	0.9758
49.17	0.9719
0.00	0.9646

719. B = C₁₃H₁₁NO

Benzanilide

(to 12.75 Wt. % B)(70)

*d*₄²⁵ = (0.9746 + 0.021709

Wt. % B) ± 0.05%

720. B = C₁₃H₁₂N₂O

Carbanilide

(to 7.18 Wt. % B)(70)

*d*₄²⁵ = (0.9746 + 0.021615

Wt. % B) ± 0.05%

721. B = C₁₃H₁₂N₂S

Thiocarbanilide

(±0.05%)(70)

Wt. % A	<i>d</i> ₄ ²⁵
100.00	0.9746
92.60	0.9919
85.49	1.0050

722. B = C₁₄H₉NO₂Phthalanil (70)¹723. B = C₂₀H₁₆Br₂O₈Methyl di-[*o*-bromobenzoyl]-tartrate (88)

v. also 15, 171, 183, 185, 318, 354, 370, 394, 491, 558, 559, 563, 587, 608, 614

C₅H₇NO₂

Ethyl cyanoacetate

724. B = C₈H₂₀INTetraethylammonium iodide (330)¹**C₅H₈O**

Propargyl ethyl ether

725. B = C₇H₁₄O₂

Isoamyl acetate

(0–100 Wt. % A)(125)

*d*₄²⁵ = (0.8664 – 0.0334

Wt. % A) ± 0.05%

C₅H₈O₂

Acetylacetone

726. B = C₈H₂₀INTetraethylammonium iodide (329)¹**C₅H₈O₃**

Methyl acetoacetate

727. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(223)

a | 10³*b*

(15.3°–54°)

10.21 Wt. % B

1.0919 | 1.033(*t*–15.3)

(16.9°–57.3°)

25.23 Wt. % B

1.1102 | 1.071(*t*–16.9)

(15.6°–56.2°)

50.46 Wt. % B

1.1429 | 1.011(*t*–15.6)**C₅H₈O₄**

Dimethyl malonate

728. B = C₈H₂₀INTetraethylammonium iodide (330)¹728.5. B = C₁₂H₂₈INTetrapropylammonium iodide (330)¹**C₅H₁₀**

Amylene

729. B = C₆H₆ (103)730. B = C₆H₇N

Aniline

(±0.25%)(314)

Wt. % B	<i>d</i> ₄ ²⁰
0.0	0.658
27.8	0.743
61.1	0.857
76.0	0.913
100.0	1.022

v. also 49, 101, 280, 395, 668**C₅H₁₀O**

Allyl ethyl ether

731. B = C₇H₁₄O₂

Isoamyl acetate

(±0.05%)(125)

Wt. % B	<i>d</i> ₄ ²⁵
100.00	0.8664
94.36	0.8628
89.42	0.8591
0.00	0.7993

C₅H₁₀O₂

Valeric acid

732. B = C₁₀H₁₆O

Camphor (323, 342)

C₅H₁₀O₂

Isovaleric acid

*v. 50***C₅H₁₀O₂**

Isobutyl formate

733. B = C₅H₁₀O₂

Ethyl propionate

(0°–40°)(±0.025%)(24)

a | 10³*b*

100.00 Wt. % A

0.9066 | 1.075*t*

49.875 Wt. % A

0.9094 | 1.106*t*

0.000 Wt. % A

0.9122 | 1.139*t*734. B = C₅H₁₀O₂

Propyl acetate

(0°–40°)(±0.025%)(24)

a | 10³*b*

100.000 Wt. % A

0.9066 | 1.075*t*

50.556 Wt. % A

0.9076 | 1.094*t*

0.000 Wt. % A

0.9084 | 1.111*t*735. B = C₈H₁₀

Ethylbenzene

(0°–40°)(±0.025%)(24)

a | 10³*b*

0.000 Wt. % A

0.8913 | 0.8863*t*

51.162 Wt. % A

0.8983 | 0.9788*t*

100.000 Wt. % A

0.9066 | 1.0750*t**v. also* 615, 654**C₅H₁₀O₂**

Ethyl propionate

736. B = C₅H₁₀O₂

Propyl acetate

(to 40°)(±0.025%)(24)

a | 10³*b*

100.000 Wt. % A

0.91220 | 1.139*t*

49.776 Wt. % A

0.91020 | 1.124*t*

0.000 Wt. % A

0.90835 | 1.111*t*737. B = C₅H₁₂Isopentane (24)¹738. B = C₆H₄Br₂*p*-Dibromobenzene (158)739. B = C₆H₆ (158)740. B = C₉H₁₂

1, 2, 4-Trimethylbenzene

(to 40°)(±0.025%)(24)

a | 10³*b*

100.000 Wt. % A

0.91220 | 1.1388*t*

53.579 Wt. % A

0.90180 | 0.9675*t*

0.000 Wt. % A

0.89260 | 0.8088*t*741. B = C₁₀H₈

Naphthalene (158)

742. B = C₁₂H₁₀N₂

Azobenzene (158)

v. also 616, 733**C₅H₁₀O₂**

Methyl butyrate

743. B = C₆H₄Br₂*p*-Dibromobenzene (158)744. B = C₆H₆ (158)745. B = C₁₀H₈

Naphthalene (158)

746. B = C₁₂H₁₀N₂

Azobenzene (158)

747. B = C₁₄H₁₀

Phenanthrene (158)

v. also 595**C₅H₁₀O₂**

Propyl acetate

748. B = C₆H₁₂O₂

Amyl formate

(±0.05%)(157)

*d*₄^t =

0 Mol % B

0.9049(1 – 0.021203*t*)

26 Mol % B

0.9029(1 – 0.021171*t*)

70 Mol % B

0.8999(1 – 0.021125*t*)

100 Mol % B

0.8971(1 – 0.021097*t*)749. B = C₆H₁₄Isohexane (24)¹750. B = C₉H₁₂

1, 2, 4-Trimethylbenzene

(to 40°)(±0.025%)(24)

a | 10³*b*

100.000 Wt. % A

0.9084 | 1.1112*t*

53.615 Wt. % A

0.9000 | 0.9575*t*

0.000 Wt. % A

0.8926 | 0.8075*t**v. also* 734, 736**C₅H₁₀O₃**Methyl *l*-α-methoxypropionate751. B = C₆H₅NO₂

Nitrobenzene

(±0.05%)(211)

(–16.6° to +130°)

a | 10³*b*

0.00 Wt. % B

1.0361 | 1.143(*t*+16.6)

(16.6°–119°)

90.10 Wt. % B

1.1841 | 1.022(*t* – 16.6)*v. also* 255**C₅H₁₁Br***l*-Amyl bromide752. B = C₁₀H₁₇NO*d*-Camphoroxime (145)

753. B = C ₁₀ H ₁₇ NO <i>l</i> -Camphoroxime (145)	
C ₅ H ₁₁ N, Piperidine	
754. B = C ₆ H ₆ (142)	
755. B = C ₇ H ₈ Toluene (122, 251)	
$d_4^{46.6} = (0.8380 - 0.0417$ Mol % A) $\pm 0.1\%$ (83.33 Mol % B) ($\pm 0.1\%$)	
<i>t</i>	d_4^t
14.5	0.8684
46.6	0.8377
78.4	0.8077
132.5	0.7535
<i>v. also</i> 495, 588	
C ₅ H ₁₂ Pentane	
<i>v. also</i> 102, 669	
C ₅ H ₁₂ Isopentane	
756. B = C ₆ H ₁₄ <i>n</i> -Hexane (24) ¹	
757. B = C ₉ H ₁₂ Trimethylbenzene (24) ¹	
<i>v. also</i> 737	
C ₅ H ₁₂ O Amyl alcohol	
758. B = C ₆ H ₆ (35, 391)	
759. B = C ₈ H ₂₀ IN Tetraethylammonium iodide	
(331) ¹	
<i>v. also</i> 103, 201, 396, 507	
C ₅ H ₁₂ O Isoamyl alcohol	
760. B = C ₆ H ₅ NO ₂ Nitrobenzene	
($\pm 0.075\%$) (68, 150)	
Wt. % A	d_4^{60}
100.00	0.8253
90.02	0.8541
70.01	0.9166
50.00	0.9866
29.98	1.0703
9.94	1.1664
0.00	1.2206
Wt. % A	d_4^{60}
100.00	0.7636
90.02	0.7914
70.03	0.8497
49.96	0.9151
30.03	0.9943
10.06	1.0875
0.00	1.1444
760.5. B = C ₆ H ₆ (351)	
($\pm 0.1\%$) (361)	
Wt. % A	$d_4^{18.4}$
0.000	0.8800
0.911	0.8800
1.727	0.8798
2.520	0.8792
3.655	0.8785
8.670	0.8754

Wt. % A	$d_4^{18.4}$
12.670	0.8727
18.495	0.8686
36.000	0.8587
761. B = C ₆ H ₁₀ O ₈ Citric acid monohydrate (296) ^{1,2}	
762. B = C ₆ H ₁₂ O ₃ Paraldehyde	
($\pm 0.075\%$) (68, 150)	
Wt. % A	d_4^{10}
100.00	0.8183
90.00	0.8327
70.00	0.8659
50.00	0.9011
30.05	0.9401
10.00	0.9822
0.00	1.0037
Wt. % A	$d_4^{76.5}$
100.00	0.7656
89.98	0.7785
70.02	0.8061
50.00	0.8366
29.99	0.8719
9.96	0.9076
0.00	0.9248
762.5. B = C ₆ H ₁₄ Hexane ($\pm 0.1\%$) (361)	
Wt. % A	$d_4^{18.4}$ (?)
0.000	0.6660
1.208	0.6709
3.591	0.6778
4.770	0.6795
17.600	0.6918
23.060	0.7024
100.000	0.8116
763. B = C ₇ H ₆ O ₂ Benzoic acid (296) ^{1,2}	
764. B = C ₇ H ₆ O ₃ Salicylic acid (296) ^{1,2}	
765. B = C ₇ H ₈ O ₆ Gallic acid monohydrate (296) ^{1,2}	
766. B = C ₈ H ₁₀ N ₄ O ₂ Caffeine (292) ²	
767. B = C ₁₀ H ₁₃ NO ₂ Phenacetine (292) ²	
768. B = C ₁₀ H ₁₅ N Diethylaniline	
($\pm 0.075\%$) (68, 150)	
Wt. % A	d_4^{60}
100.00	0.8253
90.03	0.8367
70.52	0.8586
50.08	0.8834
30.52	0.9091
10.00	0.9367
0.00	0.9504
Wt. % A	$d_4^{76.5}$
100.00	0.7656
90.02	0.7764
70.00	0.7995
50.08	0.8218
30.15	0.8473

Wt. % A	$d_4^{76.5}$
10.07	0.8741
0.00	0.8901
769. B = C ₁₀ H ₁₆ O ₄ Camphoric acid (296) ^{1,2}	
770. B = C ₁₃ H ₁₀ O ₃ Salol (292) ²	
771. B = C ₁₈ H ₃₄ O ₂ Oleic acid (57)	
772. B = C ₁₈ H ₃₆ O ₂ Stearic acid (296) ^{1,2}	
<i>v. also</i> 86, 172, 396.5, 577, 592	
C ₅ H ₁₂ O Dimethylethyl carbinol, <i>v.</i> 233	
C ₅ H ₁₂ O <i>n</i> -Propyl ethyl ether	
773. B = C ₇ H ₁₄ O ₂ Isoamyl acetate	
(0-100 Wt. % A) (125)	
$d_4^{25} = (0.8664 - 0.021052$ Wt. % A) $\pm 0.05\%$	
C ₆ H ₃ N ₃ O ₆ 1, 3, 5-Trinitrobenzene	
774. B = C ₁₀ H ₈ Naphthalene (163.1)	
($\pm 0.05\%$) (163)	
Mol % B	d_4^{152}
0	1.4769
25	1.3676
40	1.2920
50	1.2370
60	1.1159
75	1.0883
100	0.9213
775. B = C ₁₂ H ₁₁ N Diphenylamine	
($\pm 0.5\%$) (311)	
Mol % B	d_4^{130}
100	1.065
80	1.100
60	1.140
40	1.200
20	1.265
0	1.333
<i>v. also</i> 397	
C ₆ H ₃ N ₃ O ₇ Picric acid	
776. B = C ₆ H ₆ (148) ¹	
<i>v. also</i> 398, 1276, 1277	
C ₆ H ₄ Br ₂ <i>p</i> -Dibromobenzene	
777. B = C ₆ H ₆ (158)	
($\pm 0.005\%$) (318)	
Wt. % B	d_4^{25}
100.000	0.87339
95.176	0.89724
91.022	0.91867
81.344	0.97381
72.520	1.02956
778. B = C ₆ H ₁₂ O ₂ Ethyl butyrate (158)	

779. B = C ₆ H ₁₂ O ₃ Paraldehyde (158)	
780. B = C ₆ H ₁₄ Hexane (318) ¹	
781. B = C ₇ H ₈ Toluene (158)	
($\pm 0.005\%$) (318)	
Wt. % A	d_4^{25}
0.000	0.86137
3.771	0.88001
7.744	0.90046
13.631	0.93323
23.644	0.99323
782. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (158, 318) ¹	
783. B = C ₇ H ₁₄ O ₂ Propyl butyrate (158)	
784. B = C ₈ H ₈ O ₂ Methyl benzoate (158)	
<i>v. also</i> 16, 51, 104, 281, 344, 355, 399, 551, 596, 617, 650, 670, 738, 743	
C ₆ H ₄ Br ₃ N 2, 4, 6-Tribromoaniline	
785. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (306) ¹	
C ₆ H ₄ ClNO ₂ <i>o</i> -Chloronitrobenzene	
786. B = C ₁₂ H ₁₁ N Diphenylamine	
($\pm 0.5\%$) (311)	
Mol % A	d_4^{60}
0	1.060
10	1.075
20	1.100
30	1.130
40	1.145
50	1.170
60	1.200
70	1.230
80	1.260
90	1.290
100	1.335
C ₆ H ₄ Cl ₂ <i>p</i> -Dichlorobenzene	
787. B = C ₆ H ₅ Cl Chlorobenzene	
($\pm 0.1\%$) (25)	
Wt. % B	d_4^{60}
97.34	1.1323
94.87	1.1363
92.45	1.1402
90.07	1.1441
84.74	1.1528
82.69	1.1561
80.11	1.1605
74.84	1.1693
69.58	1.1782
67.80	1.1811
66.80	1.1830
0.00	1.1282

C₆H₄Cl₂—(Continued)B = C₆H₅Cl.—(Continued)

Wt. % B	$d_4^{13.5}$
100.00	1.1135
97.34	1.1176
94.87	1.1214
92.45	1.1253
90.07	1.1292
84.74	1.1377
82.69	1.1413
80.11	1.1415
74.84	1.1541
69.58	1.1632
67.80	1.1662
66.80	1.1679
64.98	1.1710
60.18	1.1797
55.36	1.1800

C₆H₄Cl₂

Dichlorobenzene

v. 17

C₆H₄Cl₃N

2, 4, 6-Trichloroaniline

788. B = C₇H₁₄O₂Isoamyl acetate (306)¹**C₆H₄N₂O₄***m*-Dinitrobenzene789. B = C₆H₆(±0.01 %)(¹⁵⁸, ³¹⁸)a | 10^{3b}

(15°–70°)

100.000 Wt. % B

0.88441 | 1.081(*t* – 15)

(15°–60°)

95.399 Wt. % B

0.90082 | 1.065(*t* – 15)

(20°–70°)

91.795 Wt. % B

0.90893 | 1.068(*t* – 20)

(15°–70°)

86.036 Wt. % B

0.93598 | 1.062(*t* – 15)790. B = C₇H₈Toluene (¹⁵⁸, ³¹⁹)(±0.01 %)(³¹⁸)a | 10^{3b}

(15°–70°)

0.000 Wt. % A

0.8705 | 0.938(*t* – 15)

(20°–70°)

3.931 Wt. % A

0.8807 | 0.922(*t* – 20)

(15°–70°)

7.128 Wt. % A

0.8974 | 0.940(*t* – 15)

13.491 Wt. % A

0.9225 | 0.940(*t* – 15)791. B = C₁₀H₈Naphthalene (^{163.1})(±0.05 %)(¹⁶³)

Mol % A	d_4^{30}	d_4^{52}
0.0	1.3639	
25.0	1.2663	
42.5	1.1975	1.2180
50.0	1.1706	1.1955
54.0	1.1512	1.1751
60.0	1.1319	1.1613
75.0	1.0753	
100.0	0.9696	

v. also 105, 618, 1280

C₆H₅Br

Bromobenzene

792. B = C₆H₅ClChlorobenzene (³⁵, ³⁴⁹)(±0.025 %)(²³)

Wt. % A	d_4^{20}
100.000	1.4960
80.603	1.4223
68.989	1.3777
45.179	1.2854
25.320	1.2074
10.723	1.1494
0.000	1.1065

(±0.05 %)(¹⁵⁷) $d_4^t =$

0.0 Mol % A

1.1257(1 – 0.03935*t*)

20.2 Mol % A

1.2114(1 – 0.03946*t*)

67.4 Mol % A

1.3770(1 – 0.03943*t*)

100.00 Mol % A

1.5158(1 – 0.03853*t*)793. B = C₆H₆ (⁶¹, ¹⁸⁶)(±0.01 %)(²³)

Wt. % B	d_4^{20}
0.000	1.4960
36.892	1.2918
53.614	1.1910
67.696	1.1016
82.230	1.0046
100.000	0.8790

(to 80°)(±0.1 %)(¹⁸⁵)a | 10^{3b}

100.00 Wt. % B

0.9003 | 1.073*t*

75.26 Wt. % B

1.0001 | 1.107*t*

49.73 Wt. % B

1.1330 | 1.186*t*

25.26 Wt. % B

1.2948 | 1.251*t*

0.00 Wt. % B

1.5215 | 1.354*t*794. B = C₇H₈

Toluene

(±0.025 %)(²³)

Wt. % A	d_4^{20}
100.000	1.4960
65.796	1.2801
41.048	1.1241
22.297	1.0061
0.000	0.8661

795. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05 %)(²¹⁷)

Wt. % A	d_4^{20}
100.00	1.4938
95.00	1.4744
90.07	1.4567
52.03	1.3355
0.00	1.2052

a | 10^{3b}

(14.3°–100.6°)

100.00 Wt. % A

1.5013 | 1.340(*t* – 14.3)

(18.6°–100.6°)

90.07 Wt. % A

1.4585 | 1.320(*t* – 18.6)

(19.4°–100.8°)

75.06 Wt. % A

1.4043 | 1.263(*t* – 19.4)

(19.1°–101.0°)

52.03 Wt. % A

1.3366 | 1.195(*t* – 19.1)

(16.8°–99.4°)

0.00 Wt. % A

1.2085 | 1.016(*t* – 16.8)796. B = C₈H₂₀IN

Tetraethylammonium iodide

(331)¹

v. also 18, 52, 106, 319, 400, 508

C₆H₅Br₂N

2, 4-Dibromoaniline

797. B = C₇H₁₄O₂Isoamyl acetate (306)¹**C₆H₅Br₂N**

2, 6-Dibromoaniline

798. B = C₇H₁₄O₂Isoamyl acetate (306)¹**C₆H₅Cl**

Chlorobenzene

799. B = C₆H₆ (²⁵, ¹³⁵, ⁹⁹, ¹⁸⁶)(±0.025 %)(²³)

Wt. % B	d_4^{20}
0.000	1.1065
31.171	1.0419
57.896	0.9820
77.462	0.9357
100.000	0.8790

(to 80°)(±0.075 %)(¹⁸⁵)a | 10^{3b}

0.00 Wt. % B

1.1283 | 1.080*t*

25.39 Wt. % B

1.0592 | 1.073*t*

49.46 Wt. % B

1.0020 | 1.081*t*

74.84 Wt. % B

0.9483 | 1.081*t*

100.000 Wt. % B

0.9002 | 1.073*t*800. B = C₆H₆O

Phenol

(±0.01 %)(²⁷)

Wt. % A	d_4^{20}
100.00	1.1050
95.07	1.1033
90.22	1.1017
78.27	1.0979
69.57	1.0953
61.10	1.0929
50.10	1.0897
41.85	1.0873
28.59	1.0835
18.55	1.0805
0.00	1.0752

801. B = C₇H₈Toluene (¹⁵⁸)(±0.025 %)(²³)

Wt. % A	d_4^{20}
100.000	1.1065
71.678	1.0369
45.779	0.9744
21.516	0.9167
13.803	0.8985
7.060	0.8826
0.000	0.8661

(±0.0075 %)(¹⁷¹)

Wt. % A	d_4^{25}
100.000	1.10026
80.249	1.04460
46.646	0.95883
22.292	0.90535
20.427	0.90148
0.000	0.86053

802. B = C₇H₁₆Heptane (⁶¹)803. B = C₇H₁₆OEthyl amyl ether (⁶¹)804. B = C₈H₁₀*m*-Xylene (⁶¹)805. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05 %)(²¹⁷)a | 10^{3b}

(17.05°–38.53°)

100.00 Wt. % A

1.1096 | 1.080(*t* – 17.05)

(18.5°–31.87°)

96.19 Wt. % A

1.1106 | 1.084(*t* – 18.5)

(15°–99°)

89.99 Wt. % A

1.1202 | 1.101(*t* – 15)

(14.7°–99.0°)

75.00 Wt. % A

1.1342 | 1.101(*t* – 14.7)

(17.9°–101.3°)

52.53 Wt. % A

1.1516 | 1.078(*t* – 17.9)

(18.8°–49.5°)

24.65 Wt. % A

1.1795 | 1.081(*t* – 18.8)

(16.8°–99.4°)

0.00 Wt. % A

1.2085 | 1.016(*t* – 16.8)

806. B = C ₁₀ H ₈ Naphthalene (to 2.132 Wt. % B) ⁽⁵⁴⁾ $d_4^{18} = (1.10864 - 0.03835$ Wt. % B) $\pm 0.0075\%$		Wt. % B	d_4^{40}	Wt. % B	d_4^{50}	Wt. % B	d_4^{10}
		100.00	1.0045	31.50	1.0404	100.00	1.1001
		84.46	1.0377	22.20	1.0589	83.21	1.1331
		70.06	1.0680	10.35	1.0822	67.47	1.1643
		59.84	1.0931	0.00	1.1027	57.61	1.1837
		53.39	1.1083			51.19	1.1956
		48.32	1.1198	809. B = C ₆ H ₈ N ₂ Phenylhydrazine ($\pm 0.1\%$)(³⁰⁷)		49.69	1.1985
		43.13	1.1316	Wt. % A	d_4^{50}	46.72	1.2038
		39.39	1.1399	100.0	1.203	45.06	1.2066
		34.82	1.1503	85.2	1.187	42.08	1.2112
		31.50	1.1582	64.0	1.166	36.58	1.2188
		22.20	1.1790	53.5	1.154	27.82	1.2301
		10.35	1.2055	50.7	1.145	13.34	1.2474
		0.00	1.2282	25.0	1.108	0.00	1.2622
		Wt. % B	d_4^{60}	0.0	1.068	Wt. % B	d_4^{20}
		100.00	0.9872			100.00	1.0925
		84.46	1.0197	810. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (³⁰⁵) ¹		83.21	1.1250
		70.06	1.0496			67.47	1.1557
		59.84	1.0739	811. B = C ₈ H ₁₁ N Dimethylaniline (to 80°)($\pm 0.025\%$)(²⁸)		57.61	1.1748
		53.39	1.0888	a	10 ^b	51.19	1.1867
		48.32	1.1000	0.00 Wt. % A		49.69	1.1895
		43.13	1.1116	0.9726	0.8213 t	46.72	1.1948
		39.39	1.1196	14.67 Wt. % A		45.06	1.1975
		34.82	1.1300	1.0070	0.8700 t	42.08	1.2021
		31.50	1.1376	27.71 Wt. % A		36.58	1.2095
		22.20	1.1580	1.0432	0.9075 t	27.82	1.2205
		10.35	1.1837	40.65 Wt. % A		13.34	1.2363
		0.00	1.2058	1.0819	0.9475 t	0.00	1.2508
		Wt. % B	d_4^{80}	52.49 Wt. % A		Wt. % B	d_4^{30}
		100.00	0.9700	1.1191	0.9850 t	100.00	1.0849
		84.46	1.0017	60.40 Wt. % A		83.21	1.1169
		70.06	1.0311	1.1443	1.0050 t	67.47	1.1472
		59.84	1.0547	70.50 Wt. % A		57.61	1.1660
		53.39	1.0693	1.1761	1.0325 t	51.19	1.1777
		48.32	1.0802	75.41 Wt. % A		49.69	1.1805
		43.13	1.0916	1.1928	1.0550 t	46.72	1.1858
		39.39	1.0993	80.87 Wt. % A		45.06	1.1883
		34.82	1.1096	1.2108	1.0725 t	42.08	1.1930
		31.50	1.1169	83.81 Wt. % A		36.58	1.2001
		22.20	1.1371	1.2205	1.0825 t	27.82	1.2106
		10.35	1.1619	90.14 Wt. % A		13.34	1.2253
		0.00	1.1832	1.2414	1.1000 t	0.00	1.2397
		Wt. % B	d_4^{110}	100.00 Wt. % A		Wt. % B	d_4^{40}
		100.00	0.9431	1.2737	1.1338 t	100.00	1.0772
		84.46	0.9739	812. B = C ₉ H ₇ N Quinoline ($\pm 0.01\%$)(²⁸)		83.21	1.1089
		70.06	1.0019	Wt. % B	d_4^0	67.47	1.1387
		59.84	1.0248	100.00	1.1077	57.61	1.1573
		53.39	1.0389	83.21	1.1412	51.19	1.1688
		48.32	1.0493	67.47	1.1728	49.69	1.1715
		43.13	1.0603	57.61	1.1925	46.72	1.1768
		39.39	1.0678	51.19	1.2045	45.06	1.1792
		34.82	1.0774	49.69	1.2074	42.08	1.1838
		31.50	1.0843	46.72	1.2128	36.58	1.1906
		22.20	1.1038	45.06	1.2156	27.82	1.2006
		10.35	1.1280	42.08	1.2203	13.34	1.2149
		0.00	1.1489	36.58	1.2282	0.00	1.2282
		Wt. % B	d_4^{150}	27.82	1.2403	Wt. % B	d_4^{60}
		100.00	0.9053	13.34	1.2581	100.00	1.0614
		84.46	0.9355	0.00	1.2737	83.21	1.0928
		70.06	0.9620			67.47	1.1220
		59.84	0.9839			57.61	1.1402
		53.39	0.9972			51.19	1.1510
		48.32	1.0069			49.69	1.1537
		43.13	1.0177			46.72	1.1588
		39.39	1.0249			45.06	1.1611
		34.82	1.0339				

C₆H₅ClO—(Continued)B = C₉H₇N.—(Continued)

Wt. % B	d_4^{60}
42.08	1.1655
36.58	1.1718
27.82	1.1811
13.34	1.1941
0.00	1.2058
Wt. % B	d_4^{80}
100.00	1.0458
83.21	1.0767
67.47	1.1053
57.61	1.1230
51.19	1.1333
49.69	1.1360
46.72	1.1407
45.06	1.1433
42.08	1.1473
36.58	1.1531
27.82	1.1615
13.34	1.1732
0.00	1.1832
Wt. % B	d_4^{110}
100.00	1.0213
83.21	1.0517
67.47	1.0790
57.61	1.0952
51.19	1.1049
49.69	1.1072
46.72	1.1118
45.06	1.1139
42.08	1.1175
36.58	1.1232
27.82	1.1311
13.34	1.1413
0.00	1.1489
Wt. % B	d_4^{150}
100.00	0.9879
83.21	1.0178
67.47	1.0428
57.61	1.0574
51.19	1.0664
49.69	1.0681
46.72	1.0721
45.06	1.0741
42.08	1.0772
36.58	1.0822
27.82	1.0893
13.34	1.0976
0.00	1.1027

813. B = C₁₃H₁₃N
Diphenylmethylaniline
(to 80°)(±0.025%)(²⁸)

a	10 ³ b
0.00 Wt. % A	
1.0674	0.7888 <i>t</i>
13.83 Wt. % A	
1.0923	0.8200 <i>t</i>
25.90 Wt. % A	
1.1146	0.8575 <i>t</i>
38.35 Wt. % A	
1.1391	0.8975 <i>t</i>
50.52 Wt. % A	
1.1637	0.9350 <i>t</i>

a	10 ³ b
57.58 Wt. % A	
1.1788	0.9750 <i>t</i>
68.76 Wt. % A	
1.2030	1.0150 <i>t</i>
79.34 Wt. % A	
1.2261	1.0525 <i>t</i>
89.62 Wt. % A	
1.2492	1.0925 <i>t</i>
100.00 Wt. % A	
1.2737	1.1388 <i>t</i>
<i>v. also</i> 402, 510, 702	

C₆H₅ClO*m*-Chlorophenol814. B = C₆H₇N

Aniline

(±0.1%)(³⁰⁷)

Wt. % B	d_4^{25}
0.0	1.268
9.0	1.238
19.4	1.207
30.1	1.181
40.3	1.153
60.1	1.104
75.4	1.071
100.0	1.022
Wt. % B	d_4^{50}
0.0	1.237
9.0	1.210
19.4	1.180
30.1	1.153
40.3	1.126
60.1	1.077
75.4	1.045
100.0	0.992

815. B = C₇H₁₄O₂Isoamyl acetate (305)¹*v. also* 403**C₆H₅ClO***p*-Chlorophenol816. B = C₆H₇N

Aniline

(±0.1%)(³⁰⁷)

Wt. % B	d_4^{25}
7.8	1.249
15.4	1.228
22.2	1.209
29.9	1.185
37.2	1.166
41.8	1.154
50.2	1.133
70.2	1.084
90.3	1.037
100.0	1.022
Wt. % B	d_4^{50}
0.0	1.244
7.8	1.223
15.4	1.199
22.2	1.179
29.9	1.158
37.2	1.140
41.8	1.128
50.2	1.107

Wt. % B	d_4^{50}
70.2	1.058
90.3	1.012
100.0	0.992

817. B = C₇H₁₄O₂Isoamyl acetate (305)¹*v. also* 404**C₆H₅Cl₂N**

2, 4-Dichloroaniline

818. B = C₇H₁₄O₂Isoamyl acetate (306)¹**C₆H₅F**

Fluorobenzene

818.5 B = C₆H₆(to 80°)(±0.075%)(¹⁸⁵)

a	10 ³ b
0.00 Wt. % B	
1.0468	1.216 <i>t</i>
24.98 Wt. % B	
1.0052	1.159 <i>t</i>
50.24 Wt. % B	
0.9687	1.159 <i>t</i>
74.22 Wt. % B	
0.9345	1.125 <i>t</i>
100.00 Wt. % B	
0.9002	1.073 <i>t</i>

C₆H₅I

Iodobenzene

819. B = C₆H₆(to 80°)(±0.075%)(¹⁸⁵)

a	10 ³ b
0.00 Wt. % B	
1.8611	1.520 <i>t</i>
25.16 Wt. % B	
1.4662	1.406 <i>t</i>
50.05 Wt. % B	
1.2133	1.294 <i>t</i>
100.00 Wt. % B	
0.9002	1.073 <i>t</i>

820. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(²¹⁷)

a	10 ³ b
(19.5°–38.5°)	
0.00 Wt. % B	
1.8316	1.575(<i>t</i> – 19.5)
(18.85°–51.6°)	
9.93 Wt. % B	
1.7313	1.495(<i>t</i> – 18.85)
(19.5°–50.6°)	
24.94 Wt. % B	
1.6148	1.413(<i>t</i> – 19.5)
(18.3°–53.2°)	
47.97 Wt. % B	
1.4502	1.259(<i>t</i> – 18.3)
(19.25°–36.2°)	
75.30 Wt. % B	
1.3135	1.132(<i>t</i> – 19.25)

C₆H₅I₂N

2, 4-Diiodoaniline

821. B = C₇H₁₄O₂

Isoamyl acetate (306)

C₆H₅NO₂

Nitrobenzene

823. B = C₆H₆ (14, 122,¹ 142,
158, 240)(50 Wt. % B)(±0.025%)(¹⁷⁸)

<i>t</i>	d_4^t
0	1.03874
25	1.01248
40	0.99731
55	0.98282
70	0.96678

(±0.1%)(³⁶¹)

Wt. % B	d_4^{20}
0.000	1.2048
0.282	1.2040
0.353	1.2032
0.773	1.2022
1.419	1.2000
3.118	1.1920
7.250	1.1734
16.335	1.1382
100.000	0.8800

(±0.0075%)(¹⁷¹)

Wt. % B	d_4^{25}
0.000	1.19823
14.391	1.13851
37.604	1.05304
80.049	0.92504
100.000	0.87421

824. B = C₆H₆O

Phenol

(±0.01%)(²⁷)

Wt. % A	d_4^{20}
100.00	1.2019
95.84	1.1955
91.16	1.1886
81.88	1.1754
72.59	1.1633
62.04	1.1494
50.27	1.1345
41.36	1.1232
28.97	1.1084
15.32	1.0926
0.00	1.0751

825. B = C₆H₇NAniline (±0.075%)(¹¹²)

(25°–90°)

62.92 Wt. % B

a	10 ³ b
1.1343	0.903(<i>t</i> – 25)

(±0.25%)(¹⁵⁶) $d_4^{20} = (1.038 + 0.02184$
Mol % A) $d_4^{62} = (0.987 + 0.02176$
Mol % A)826. B = C₆H₁₀O₄Methyl *l*-α-acetoxypropionate
(±0.05%)(²¹¹)a | 10³b
(–7.4° to +141°)

0.00 Wt. % A

1.1198 | 1.144(*t* + 7.4)
(0.3°–141°)

89.86 Wt. % A

1.2103 | 1.006(*t* – 0.3)

827. B = C ₆ H ₁₀ O ₆ Methyl tartrate (14°–41°)(±0.05%)(²¹⁰) 95.06 Wt. % A		$d_4^t =$ 100 Mol % A 1.2220(1 – 0.0 ₃ 7804 <i>t</i>) 75 Mol % A 1.1618(1 – 0.0 ₃ 7930 <i>t</i>) 50 Mol % A 1.1060(1 – 0.0 ₃ 8040 <i>t</i>) 25 Mol % A 1.0521(1 – 0.0 ₃ 8060 <i>t</i>) 0 Mol % A 1.0028(1 – 0.0 ₃ 7980 <i>t</i>)		a | 10 ³ b (65.3°–153°) 0.00 Wt. % A 1.1250 | 1.052(<i>t</i> – 65.3) (15.6°–150°) 90.90 Wt. % A 1.2039 | 0.993(<i>t</i> – 15.6)		(±0.005%)(³¹⁸) Wt. % A | d_4^{25} 100.000 | 1.19761 97.984 | 1.18915 94.225 | 1.17376	
828. B = C ₆ H ₁₂ O ₃ Paraldehyde (¹⁵⁸) (±0.1%)(³⁶¹)		834. B = C ₇ H ₉ N <i>o</i> -Toluidine (±0.05%)(¹⁵⁷) $d_4^t =$ 100 Mol % A 1.2220(1 – 0.0 ₃ 7804 <i>t</i>) 75 Mol % A 1.1677(1 – 0.0 ₃ 8040 <i>t</i>) 50 Mol % A 1.1159(1 – 0.0 ₃ 8160 <i>t</i>) 0 Mol % A 1.0647(1 – 0.0 ₃ 8160 <i>t</i>)		840. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (²²⁰) (±0.075%)(²⁰⁸)		845. B = C ₁₀ H ₁₅ N Diethylaniline (±0.05%)(¹⁵⁷) $d_4^t =$ 100.00 Mol % A 1.2220(1 – 0.0 ₃ 7804 <i>t</i>) 66.67 Mol % A 1.1071(1 – 0.0 ₃ 7910 <i>t</i>) 33.33 Mol % A 1.0147(1 – 0.0 ₃ 7720 <i>t</i>) 0.00 Mol % A 0.9508(1 – 0.0 ₃ 8455 <i>t</i>)	
Wt. % B | d_4^{20} 0.000 | 1.2048 0.443 | 1.2032 0.685 | 1.2024 0.906 | 1.2020 1.778 | 1.2000 3.442 | 1.1968 4.555 | 1.1944 9.000 | 1.1852 17.630 | 1.1670 23.650 | 1.1530		835. B = C ₈ H ₈ O ₂ Methyl benzoate (¹⁵⁸)		a | 10 ³ b (19.1°–100.0°) 0.00 Wt. % B 1.2042 | 0.978(<i>t</i> – 19.1) (20.0°–99.0°) 2.00 Wt. % B 1.2030 | 0.987(<i>t</i> – 20.0) (19.0°–98.5°) 5.00 Wt. % B 1.2037 | 0.995(<i>t</i> – 19.0) (18.0°–100.0°) 10.00 Wt. % B 1.2041 | 0.989(<i>t</i> – 18.0) (17.3°–100.0°) 19.94 Wt. % B 1.2042 | 0.998(<i>t</i> – 17.3) (18.7°–100.0°) 50.02 Wt. % B 1.2029 | 1.013(<i>t</i> – 18.7) (19.3°–131.2°) 100.00 Wt. % B 1.2062 | 1.023(<i>t</i> – 19.3)		846. B = C ₁₀ H ₁₆ O ₄ Camphoric acid (²⁹⁶) ^{1,2}	
829. B = C ₇ H ₆ O ₂ Benzoic acid (²⁹⁶) ^{1,2}		836. B = C ₈ H ₉ Cl ₃ O ₇ Methyl mono(trichloro- acetyl)tartrate (17°–48.7°)(±0.05%)(²¹⁰) 95.25 Wt. % A a | 10 ³ b 1.2163 | 0.0 ₃ 963(<i>t</i> – 17)		841. B = C ₈ H ₂₀ IN Tetraethylammonium iodide (³³¹) ¹		847. B = C ₁₀ H ₂₀ O <i>l</i> -Menthol (±0.05%)(²²⁶) a | 10 ³ b (19.25°–43.2°) 98.55 Wt. % A 1.1978 | 0.981(<i>t</i> – 19.25) (8.5°–41.7°) 97.94 Wt. % A 1.2061 | 0.988(<i>t</i> – 8.5) (9.8°–78.7°) 93.35 Wt. % A 1.1853 | 0.953(<i>t</i> – 9.8) (19.1°–54.1°) 69.51 Wt. % A 1.0891 | 0.917(<i>t</i> – 19.1) (±0.25%)(²⁷³) (55.6°–99.0°) 100.00 Mol % A 1.1655 | 0.922(<i>t</i> – 55.6) 90.85 Mol % A 1.1215 | 0.988(<i>t</i> – 55.6) 69.16 Mol % A 1.0374 | 0.934(<i>t</i> – 55.6) 54.83 Mol % A 0.9915 | 0.852(<i>t</i> – 55.6) 36.73 Mol % A 0.9442 | 0.868(<i>t</i> – 55.6) 16.26 Mol % A 0.9011 | 0.826(<i>t</i> – 55.6) 0.00 Mol % A 0.8690 | 0.733(<i>t</i> – 55.6)	
830. B = C ₇ H ₆ O ₃ Salicylic acid (²⁹⁶) ^{1,2}		837. B = C ₈ H ₁₁ N Dimethylaniline (±0.05%)(¹⁵⁷) $d_4^t =$ 100 Mol % A 1.2220(1 – 0.0 ₃ 7804 <i>t</i>) 75 Mol % A 1.1582(1 – 0.0 ₃ 8190 <i>t</i>) 50 Mol % A 1.0868(1 – 0.0 ₃ 8190 <i>t</i>) 25 Mol % A 1.0266(1 – 0.0 ₃ 8410 <i>t</i>) 0 Mol % A 0.9742(1 – 0.0 ₃ 8680 <i>t</i>)		842. B = C ₁₀ H ₈ Naphthalene (¹⁵⁸ , ^{163.1}) (±0.0075%)(⁵⁴)		848. B = C ₁₂ H ₁₀ Acenaphthene (¹⁵⁸) (±0.005%)(³¹⁸) Wt. % A | d_4^{25} 100.000 | 1.19761 97.166 | 1.19385 96.135 | 1.19249	
831. B = C ₇ H ₈ Toluene (¹⁵⁸ , ³⁴⁸) (±0.0075%)(¹⁷¹)		838. B = C ₈ H ₁₁ N Ethylaniline (±0.05%)(¹⁵⁷) $d_4^t =$ 100 Mol % A 1.2220(1 – 0.0 ₃ 7804 <i>t</i>) 75 Mol % A 1.1493(1 – 0.0 ₃ 8100 <i>t</i>) 50 Mol % A 1.0853(1 – 0.0 ₃ 8220 <i>t</i>) 25 Mol % A 1.0278(1 – 0.0 ₃ 8260 <i>t</i>) 0 Mol % A 0.9792(1 – 0.0 ₃ 8740 <i>t</i>)		Wt. % B | d_4^{18} 0.000 | 1.20538 1.032 | 1.20322 2.037 | 1.20106 (±0.05%)(¹⁶³) Mol % B | d_4^{80} 0 | 1.1439 20 | 1.1135 30 | 1.0959 50 | 1.0626 70 | 1.0300 80 | 1.0120 90 | 0.9951 100 | 0.9790		849. B = C ₁₂ H ₁₀ Diphenyl (¹⁵⁸) (±0.005%)(³¹⁸) Wt. % A | d_4^{25} 100.000 | 1.19761 98.103 | 1.19389 95.751 | 1.18902	
Wt. % A | d_4^{25} 100.000 | 1.19848 84.606 | 1.13195 62.598 | 1.04733 29.050 | 0.93966 12.207 | 0.89218 0.000 | 0.86036 (±0.075%)(¹²²)		839. B = C ₈ H ₁₄ O ₆ Dimethyl <i>d</i> -dimethoxy- succinate (±0.075%)(²²²)					
Wt. % A | d_4^{55} 0.00 | 0.8330 16.92 | 0.8775 31.62 | 0.9192 57.61 | 1.0019 71.48 | 1.0517 82.03 | 1.0926 91.70 | 1.1324 100.00 | 1.1691 (±0.075%)(¹¹²) a | 10 ³ b (25°–75°) 0.00 Wt. % A 0.8599 | 0.890(<i>t</i> – 25) (25°–90°) 73.70 Wt. % A 1.0869 | 0.944(<i>t</i> – 25)							
832. B = C ₇ H ₈ O <i>o</i> -Cresol (±0.005%)(³¹⁹)							
Wt. % B | $d_4^{12.87}$ 0.000 | 1.21065 3.080 | 1.20504 9.545 | 1.19320 16.221 | 1.18142							
833. B = C ₇ H ₉ N Methylaniline (±0.05%)(¹⁵⁷)							

C₆H₅NO₂—(Continued)

850. B = C ₁₂ H ₁₀ N ₂ Azobenzene (158) (±0.005%)(318)	
Wt. % B	<i>d</i> ₄ ²⁵
0.000	1.19761
1.844	1.19490
4.479	1.19134
851. B = C ₁₂ H ₁₂ Cl ₆ O ₈ Ethyldi(trichloroacetyl)tartrate (±0.05)(210)	
a	10 ³ b
(15.2°–131°)	
0.00 Wt. % A	
1.4764	1.222(<i>t</i> – 15.2)
(12.5°–74.2°)	
95.01 Wt. % A	
1.2218	0.998(<i>t</i> – 12.5)
852. B = C ₁₂ H ₁₈ O ₈ Diethyl diacetyl tartrate (±0.25%)(273)	
a	10 ³ b
(55.6°–99.0°)	
100.00 Mol % A	
1.1655	0.922(<i>t</i> – 55.6)
(67.3°–99.0°)	
87.73 Mol % A	
1.1435	0.997(<i>t</i> – 67.3)
68.13 Mol % A	
1.1248	0.820(<i>t</i> – 67.3)
50.12 Mol % A	
1.1310	0.997(<i>t</i> – 67.3)
32.90 Mol % A	
1.1198	1.019(<i>t</i> – 67.3)
15.59 Mol % A	
1.1439	1.133(<i>t</i> – 67.3)
0.00 Mol % A	
1.1086	0.896(<i>t</i> – 67.3)
853. B = C ₁₂ H ₂₈ IN Tetrapropylammonium iodide (330) ¹	
854. B = C ₁₄ H ₁₀ Phenanthrene (158)	
855. B = C ₁₄ H ₁₀ O ₂ Benzil (158) (±0.005%)(318)	
Wt. % A	<i>d</i> ₄ ²⁵
100.000	1.19761
98.197	1.19660
95.357	1.19529
856. B = C ₁₆ H ₂₀ Cl ₆ O ₈ Isobutyl di(trichloroacetyl)- tartrate (±0.05%)(210)	
a	10 ³ b
(18.2°–157°)	
0.00 Wt. % A	
1.3584	1.044(<i>t</i> – 18.2)
(13.6°–91.9°)	
94.98 Wt. % A	
1.2164	0.991(<i>t</i> – 13.6)

857. B = C ₁₆ H ₂₄ O ₃ S Menthyl benzenesulfonate (±0.05%)(212)	
a	10 ³ b
(15.7°–70.5°)	
92.14 Wt. % A	
1.1973	0.972(<i>t</i> – 15.7)
(16.0°–78.4°)	
81.23 Wt. % A	
1.1863	0.954(<i>t</i> – 16.0)
858. B = C ₁₆ H ₂₆ O ₈ Isobutyl diacetyl- <i>d</i> -tartrate (±0.05%)(216)	
(–4.2° to +141°)	
90.32 Wt. % A	
a	10 ³ b
1.2146	0.977(<i>t</i> + 4.2)
859. B = C ₁₈ H ₁₆ O ₆ <i>act.</i> -Methyl dibenzoyl- glycerate (90)	
860. B = C ₁₈ H ₃₆ O ₂ Stearic acid (296) ^{1,2}	
861. B = C ₂₀ H ₂₆ O ₃ S Menthyl naphthalene- β-sulfonate (±0.05%)(212)	
a	10 ³ b
(12.5°–61.7°)	
97.05 Wt. % A	
1.2058	0.939(<i>t</i> – 12.5)
(12.7°–61.4°)	
91.36 Wt. % A	
1.2028	0.958(<i>t</i> – 12.7)
862. B = C ₂₄ H ₄₂ O ₆ <i>L</i> -Menthyl <i>d</i> -tartrate (±0.05%)(226)	
a	10 ³ b
(16.7°–43.3°)	
98.57 Wt. % A	
1.2038	0.974(<i>t</i> – 16.7)
(10.1°–56.9°)	
93.51 Wt. % A	
1.2012	0.969(<i>t</i> – 10.1)
863. B = C ₂₄ H ₄₂ O ₆ Di- <i>L</i> -menthyl <i>L</i> -tartrate (±0.05%)(214)	
a	10 ³ b
(17.85°–29.30°)	
98.02 Wt. % A	
1.2006	1.004(<i>t</i> – 17.85)
(17.50°–43.50°)	
94.65 Wt. % A	
1.1932	0.981(<i>t</i> – 17.50)
864. B = C ₂₈ H ₄₆ O ₈ <i>L</i> -Menthyl diacetyl- <i>L</i> -tartrate (±0.05%)(214)	
a	10 ³ b
(15°–142°)	
0.00 Wt. % A	
1.0557	0.802(<i>t</i> – 15)
(16.66°–32.80°)	
97.41 Wt. % A	
1.2017	0.991(<i>t</i> – 16.66)

a	10 ³ b
(17.75°–48.40°)	
94.64 Wt. % A	
1.1957	0.973(<i>t</i> – 17.75)
865. B = C ₂₈ H ₄₆ O ₈ <i>L</i> -Menthyl diacetyl- <i>DL</i> -tartrate	
a	10 ³ b
(±0.05%)(215)	
(19.85°–34.8°)	
95.62 Wt. % A	
1.1958	0.963(<i>t</i> – 19.85)
<i>v. also</i> 54, 87, 202, 256, 283, 321, 405, 511, 581, 619, 655, 660, 671, 751, 760, 1273	
C₆H₅NO₃ <i>o</i> -Nitrophenol	
866. B = C ₆ H ₅ (±0.005%)(319)	
Wt. % B	<i>d</i> ₄ ^{12.87}
100.000	0.88619
96.908	0.89533
93.380	0.90617
88.562	0.92127
74.895	0.96695
867. B = C ₆ H ₇ N, Aniline (±0.01%)(28)	
Wt. % B	<i>d</i> ₄ ³⁰
100.00	1.0131
89.12	1.0376
77.64	1.0654
67.23	1.0923
58.00	1.1174
48.72	1.1444
39.48	1.1715
31.68	1.1966
22.89	1.2261
14.96	1.2527
8.51	1.2741
0.00	1.3041
Wt. % B	<i>d</i> ₄ ⁴⁰
100.00	1.0045
89.12	1.0288
77.64	1.0565
67.23	1.0832
58.00	1.1079
48.72	1.1349
39.48	1.1618
31.68	1.1865
22.89	1.2160
14.96	1.2426
8.51	1.2638
0.00	1.2938
Wt. % B	<i>d</i> ₄ ⁶⁰
100.00	0.9872
89.12	1.0109
77.64	1.0382
67.23	1.0644
58.00	1.0887
48.72	1.1149
39.48	1.1418
31.68	1.1661
22.89	1.1952
14.96	1.2214
8.51	1.2427
0.00	1.2708

Wt. % B	<i>d</i> ₄ ⁸⁰
100.00	0.9700
89.12	0.9933
77.64	1.0202
67.23	1.0460
58.00	1.0698
48.72	1.0954
39.48	1.1221
31.68	1.1461
22.89	1.1746
14.96	1.2006
8.51	1.2216
0.00	1.2480
868. B = C ₇ H ₉ N <i>p</i> -Toluidine (±0.1%)(307)	
Wt. % A	<i>d</i> ₄ ⁵⁰
0.0	0.958
35.3	1.050
79.6	1.220
100.0	1.282
869. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (305) ¹	
870. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(224)	
a	10 ³ b
(47.7°–78.1°)	
23.89 Wt. % B	
1.2599	1.014(<i>t</i> – 47.7)
(56.8°–97.3°)	
51.12 Wt. % B	
1.2321	1.099(<i>t</i> – 56.8)
(12.5°–72.5°)	
74.95 Wt. % B	
1.2554	1.081(<i>t</i> – 12.5)
871. B = C ₉ H ₇ N Quinoline (±0.01)(28)	
Wt. % B	<i>d</i> ₄ ³⁰
100.00	1.0849
89.20	1.1071
78.57	1.1311
69.31	1.1518
58.39	1.1758
50.84	1.1938
41.80	1.2140
32.96	1.2339
22.44	1.2549
17.59	1.2655
13.24	1.2746
8.82	1.2842
4.46	1.2939
0.00	1.3041
Wt. % B	<i>d</i> ₄ ⁴⁰
100.00	1.0772
89.20	1.0988
78.57	1.1223
69.31	1.1429
58.39	1.1665
50.84	1.1842
41.80	1.2043
32.96	1.2240
22.44	1.2454
17.59	1.2557

Wt. % B	d_4^{40}
13.24	1.2647
8.82	1.2742
4.46	1.2838
0.00	1.2938
Wt. % B	d_4^{60}
100.00	1.0614
89.20	1.0822
78.57	1.1049
69.31	1.1248
58.39	1.1478
50.84	1.1649
41.80	1.1844
32.96	1.2036
22.44	1.2244
17.59	1.2346
13.24	1.2433
8.82	1.2521
4.46	1.2613
0.00	1.2708
Wt. % B	d_4^{80}
100.00	1.0458
89.20	1.0656
78.57	1.0878
69.31	1.1068
58.39	1.1290
50.84	1.1457
41.80	1.1647
32.96	1.1834
22.44	1.2036
17.59	1.2136
13.24	1.2218
8.82	1.2304
4.46	1.2391
0.00	1.2480

v. also 107, 406, 703

C₆H₅NO₃*m*-Nitrophenol872. B = C₇H₁₄O₂Isoamyl acetate (305)¹**C₆H₅NO₃***p*-Nitrophenol873. B = C₇H₁₄O₂Isoamyl acetate (305)¹

v. also 407

C₆H₅N₃O₄

2, 4-Dinitroaniline, v. 228

C₆H₆874. B = C₆H₆O

Phenol (±0.01%) (27)

Wt. % A	d_4^{20}
100.00	0.8773
93.96	0.8881
90.16	0.8950
79.99	0.9134
67.60	0.9371
57.91	0.9549
46.98	0.9766
36.35	0.9976
25.89	1.0194
17.80	1.0383
0.00	1.0751

875. B = C ₆ H ₇ N	
Aniline (14, 142)	
(±0.075%) (122)	
Wt. % B	d_4^{20}
100.00	1.0208
89.59	1.0034
66.65	0.9712
11.40	0.8934
0.00	0.8783
876. B = C ₆ H ₁₀ O ₃	
Ethyl acetoacetate (142, 158)	
(±0.05%) (71)	
Wt. % A	d_4^{25}
100.00	0.8736
97.22	0.8770
89.53	0.8869
56.44	0.9324
6.12	1.0126
0.00	1.0222
877. B = C ₆ H ₁₀ O ₄	
Ethyl oxalate (199) ¹	
878. B = C ₆ H ₁₂ O ₂	
Amyl formate (199) ¹	
879. B = C ₆ H ₁₂ O ₂	
Butyl acetate (199) ¹	
880. B = C ₆ H ₁₂ O ₂	
Ethyl butyrate (158, 199) ¹	
881. B = C ₆ H ₁₂ O ₃	
Paraldehyde (142, 158)	
(±0.1%) (361)	
Wt. % A	d_4^{20}
0.000	0.9948
0.442	0.9940
0.660	0.9935
1.770	0.9910
3.480	0.9892
8.915	0.9846
15.485	0.9730
81.150	0.8980
89.325	0.8892
96.160	0.8814
97.849	0.8808
99.231	0.8805
99.962	0.8803
100.000	0.8800
882. B = C ₆ H ₁₄	
<i>n</i> -Hexane (14, 35, 158, 351)	
(±0.025%) (138)	
Wt. % A	d_4^{20}
0.00	0.67743
1.24	0.67939
1.52	0.67995
9.27	0.69249
12.31	0.69759
15.07	0.70232
16.95	0.70570
21.57	0.71377
22.41	0.71535
24.22	0.71855
31.87	0.73290
33.23	0.73548
36.51	0.74197
38.38	0.74558
40.40	0.74966
41.39	0.75183

Wt. % A	d_4^0
41.54	0.75214
47.03	0.76355
55.30	0.78166
63.58	0.80081
69.18	0.81417
70.78	0.81819
77.38	0.83512
79.85	0.84161
81.34	0.84566
86.27	0.85933
88.61	0.86602
91.58	0.87452
92.80	0.87816
95.20	0.88527
100.00	0.90017
883. B = C ₇ H ₅ N ₃ O ₆	
Trinitrotoluene	
(±0.005%) (319)	
Wt. % A	$d_4^{12.87}$
100.000	0.88619
95.959	0.90238
92.736	0.91559
88.621	0.92751
86.608	0.94176
884. B = C ₇ H ₆ O	
Benzaldehyde (142)	
885. B = C ₇ H ₆ O ₂	
Benzoic acid (148, 1 296, 1 303)	
(25°–75°) (±0.1%) (112)	
4.81 Wt. % B	
a	10 ³ b
0.8818	1.062(<i>t</i> – 25)
(to 6.785 Wt. % B) (319)	
$d_4^{12.87} = (0.88638 +$	
0.021504 Wt. % B) ±0.005%	
886. B = C ₇ H ₆ O ₃	
Salicylic acid (296) ^{1,2}	
887. B = C ₇ H ₈	
(24, 195, 199, 105, 112, 1133, 158, 178, 1 186.1, 1 283, 1 351, 352) ¹	
(±0.025%) (23)	
Wt. % A	d_4^{20}
0.00	0.8661
28.22	0.8687
52.93	0.8715
78.16	0.8751
100.00	0.8790
(±0.0075%) (171)	
Wt. % A	d_4^{25}
0.000	0.86054
10.990	0.86198
30.588	0.86400
51.920	0.86682
66.576	0.86906
91.556	0.87288
100.000	0.87420
(±0.05%) (157)	
$d_4^t =$	
100 Mol % A	
0.8995(1 – 0.021325 <i>t</i>)	
75 Mol % A	
0.8957(1 – 0.021163 <i>t</i>)	

50 Mol % A	
0.8903(1 – 0.021100 <i>t</i>)	
25 Mol % A	
0.8866(1 – 0.021052 <i>t</i>)	
0 Mol % A	
0.8825(1 – 0.03982 <i>t</i>)	
888. B = C ₇ H ₈ O	
Benzyl alcohol (233) ¹	
889. B = C ₇ H ₈ O	
<i>o</i> -Cresol	
(±0.005%) (319)	
Wt. % A	$d_4^{12.87}$
100.000	0.88638
96.379	0.89155
94.827	0.89433
88.954	0.90245
77.725	0.91935
890. B = C ₇ H ₈ O	
<i>m</i> -Cresol	
(±0.05%) (157)	
$d_4^t =$	
0 Mol % A	
1.0493(1 – 0.03711 <i>t</i>)	
25 Mol % A	
1.0180(1 – 0.03967 <i>t</i>)	
50 Mol % A	
0.9795(1 – 0.03878 <i>t</i>)	
75 Mol % A	
0.9382(1 – 0.03980 <i>t</i>)	
100 Mol % A	
0.8994(1 – 0.021192 <i>t</i>)	
891. B = C ₇ H ₈ O ₆	
Gallic acid monohydrate (296) ^{1,2}	
892. B = C ₇ H ₁₂ O ₄	
Ethyl malonate (199) ¹	
893. B = C ₇ H ₁₄ O ₂	
Isoamyl acetate (158, 199) ¹	
894. B = C ₇ H ₁₄ O ₂	
Ethyl valerate (199) ¹	
895. B = C ₇ H ₁₄ O ₂	
Propyl butyrate (158)	
896. B = C ₇ H ₁₆	
Heptane (236) ¹	
897. B = C ₇ H ₁₆ O	
Diethylisopropyl alcohol (233) ¹	
898. B = C ₈ H ₈ O	
Acetophenone	
(16°–55°) (±0.1%) (29)	
a	10 ³ b
100.00 Wt. % A	
0.8832	1.06(<i>t</i> – 16)
84.49 Wt. % A	
0.9050	1.037(<i>t</i> – 16)
50.83 Wt. % A	
0.9523	0.954(<i>t</i> – 16)
32.12 Wt. % A	
0.9809	0.908(<i>t</i> – 16)
15.35 Wt. % A	
1.0070	0.9125(<i>t</i> – 16)
0.00 Wt. % A	
1.0317	0.867(<i>t</i> – 16)
899. B = C ₈ H ₈ O ₂	
Methyl benzoate (158)	

C₆H₆.—(Continued)900. B = C₈H₉NOAcetanilide (292)²901. B = C₈H₁₀

Ethylbenzene

(to 40°)(±0.025%)(24)

a | 10³b

100.000 Wt. % A

0.89993 | 1.0658*t*

57.367 Wt. % A

0.89455 | 0.9725*t*

0.000 Wt. % A

0.89130 | 0.8863*t*902. B = C₈H₁₀*m*-Xylene

(±0.05%)(157)

*d*₄²⁵ =

100 Mol % A

0.8995(1 - 0.021325*t*)

75 Mol % A

0.8931(1 - 0.021107*t*)

50 Mol % A

0.8883(1 - 0.021053*t*)

25 Mol % A

0.8851(1 - 0.021016*t*)

0 Mol % A

0.8828(1 - 0.03957*t*)903. B = C₈H₁₀N₄O₂Caffeine (292)²904. B = C₈H₁₀O₄Diallyl oxalate (148)¹905. B = C₈H₁₂O₆

Dimethyl acetylmaleate

(16.5°-45.8°)(±0.05%)(227)

4.039 Wt. % B

a | 10³b0.8909 | 1.051(*t* - 16.5)906. B = C₈H₁₄O₃

Ethyl ethylacetoacetate (158)

(±0.05%)(71)

Wt. % A | *d*₄²⁵

100.00 | 0.8736

82.25 | 0.8907

75.02 | 0.8974

63.87 | 0.9086

0.00 | 0.9754

907. B = C₈H₁₄O₄Ethyl succinate (199)¹908. B = C₈H₁₄O₆Ethyl tartrate (340,¹ 343,¹344¹)

(±0.05%)(205)

a | 10³b

(17.95°-58.90°)

100.000 Wt. % A

0.8812 | 1.085(*t* - 17.95)

(19.65°-26.53°)

98.999 Wt. % A

0.8817 | 1.075(*t* - 19.65)

(18.6°-24.53°)

98.647 Wt. % A

0.8835 | 1.063(*t* - 18.6)a | 10³b

(20°-24.22°)

97.955 Wt. % A

0.8836 | 1.068(*t* - 20)

(19.61°-45.05°)

97.479 Wt. % A

0.8851 | 1.117(*t* - 19.61)

(18.1°-24.03°)

96.983 Wt. % A

0.8879 | 1.079(*t* - 18.1)

(18.15°-45.8°)

95.003 Wt. % A

0.8924 | 1.074(*t* - 18.15)

(19.7°-25.63°)

92.466 Wt. % A

0.8969 | 1.062(*t* - 19.7)

(17.6°-61.28°)

89.998 Wt. % A

0.9053 | 1.089(*t* - 17.6)

(16.33°-25.60°)

82.582 Wt. % A

0.9254 | 1.068(*t* - 16.33)

(17.5°-60.6°)

75.022 Wt. % A

0.9443 | 1.093(*t* - 17.5)

(19.3°-62.8°)

49.996 Wt. % A

1.0165 | 1.079(*t* - 19.3)

(20.7°-60.2°)

24.801 Wt. % A

1.1026 | 1.061(*t* - 20.7)

(16.8°-99.4°)

0.000 Wt. % A

1.2085 | 1.016(*t* - 16.8)909. B = C₈H₁₈OCapryl alcohol (233)¹910. B = C₉H₁₀O₂Ethyl benzoate (199)¹911. B = C₉H₁₀O₃Ethyl salicylate (199)¹912. B = C₉H₁₁NO

Methylacetanilide (180)

913. B = C₉H₁₂

1, 2, 4-Trimethylbenzene

(to 40°)(±0.025%)(24)

a | 10³b

100.000 Wt. % A

0.8999 | 1.0650*t*

61.954 Wt. % A

0.8925 | 0.9238*t*

0.000 Wt. % A

0.8926 | 0.8075*t*914. B = C₉H₁₃NDimethyl-*o*-toluidine

(±0.075%)(122)

Wt. % A | *d*₄²⁵

100.00 | 0.8427

88.50 | 0.8488

76.64 | 0.8553

55.93 | 0.8667

36.81 | 0.8775

23.01 | 0.8855

10.44 | 0.8930

0.00 | 0.8992

915. B = C₉H₁₄OPhorone (148)¹916. B = C₉H₁₄O₆Ethyl *l*-diacetylgllycerate (90)917. B = C₁₀H₆Cl₂Dichloronaphthalene (148)¹918. B = C₁₀H₇NO₂Nitronaphthalene (148)¹919. B = C₁₀H₈Naphthalene (106, 148,¹ 158,172,¹ 354)

(±0.005%)(319)

Wt. % A | *d*₄^{12.87}

100.000 | 0.88638

97.634 | 0.88946

91.206 | 0.89805

(±0.005%)(336)

Wt. % A | *d*₄²⁵

100.000 | 0.87166

92.863 | 0.88132

83.893 | 0.89378

80.090 | 0.89906

72.852 | 0.90930

65.188 | 0.92028

 $\frac{1}{d_4^{30}} = (1.15338 - 0.0218196$

Wt. % B + 0.051076

(Wt. % B)² ± 0.005%

(48, 49)

920. B = C₁₀H₁₂O

Anethole

(±0.075%)(233)

Wt. % A | *d*₄^{19.43}

100.00 | 0.8795

96.57 | 0.8826

89.66 | 0.8911

78.86 | 0.9073

0.00 | 0.9987

921. B = C₁₀H₁₃NO₂Phenacetine (292)²922. B = C₁₀H₁₄

Durene

(±0.005%)(318)

Wt. % A | *d*₄²⁵

100.000 | 0.87339

97.405 | 0.87294

92.962 | 0.87267

90.439 | 0.87233

86.366 | 0.87208

84.068 | 0.87242

76.732 | 0.87217

923. B = C₁₀H₁₄N₂Nicotine (93,¹ 110, 341, 343¹)924. B = C₁₀H₁₄O

Thymol (354)

(15°-65°)(±0.075%)(172)

a | 10³b

100.00 Wt. % A

0.8846 | 1.036(*t* - 15)

87.86 Wt. % A

0.8943 | 1.022(*t* - 15)925. B = C₁₀H₁₅BrOBromocamphor (148)¹

(±0.1%)(235)

Wt. % A

*d*₄²⁵

100.00 | 0.8728

99.53 | 0.8743

95.49 | 0.8871

78.79 | 0.9431

67.50 | 0.9848

53.88 | 1.0409

926. B = C₁₀H₁₆OCamphor (148,¹ 354)

(to 54.20 Wt. % B)(100, 170,

175, 263, 343)

*d*₄^{18.5} = (0.8814 + 0.037801

Wt. % B) ± 0.1%

(to 50.00 Wt. % B)(100, 170,

175, 263, 343)

*d*₄²⁰ = (0.8795 + 0.037980

Wt. % B) ± 0.1%

(to 52.37 Wt. % B)(235)

*d*₄²⁵ = (0.8728 + 0.038325

Wt. % B) ± 0.1%

927. B = C₁₀H₁₆O₄Camphoric acid (296)^{1,2}928. B = C₁₀H₁₇ClTerpine hydrochloride (148)¹929. B = C₁₀H₁₈O₃

Ethyl diethylacetoacetate

(158)

(±0.05%)(71)

Wt. % A | *d*₄²⁵

100.00 | 0.8736

96.35 | 0.8766

85.84 | 0.8851

50.48 | 0.9171

31.81 | 0.9345

0.00 | 0.9646

930. B = C₁₀H₁₈O₆

Dipropyl tartrate

(±0.1%)(340)

a | 10³b

(20°-60°)

0.00 Wt. % A

1.1389 | 0.905(*t* - 20)

(20°-40°)

24.09 Wt. % A

1.0648 | 0.94(*t* - 20)

54.49 Wt. % A

0.9811 | 0.96(*t* - 20)

83.64 Wt. % A

0.9128 | 1.00(*t* - 20)931. B = C₁₀H₂₀OMenthol (148)¹

(±0.05%)(226)

a | 10³b

(9.1°-32.6°)

98.544 Wt. % A

0.8915 | 1.111(*t* - 9.1)

(7.1°-34.2°)

92.503 Wt. % A

0.8917 | 0.997(*t* - 7.1)932. B = C₁₀H₂₀O₂Amyl valerate (199)¹933. B = C₁₀H₂₀O₂*d*-β-Octyl acetate (242)*d*₄¹⁷ = (0.8794 - 0.032073

Wt. % B) ± 0.1%

934. B = C₁₂H₁₀
Acenaphthene (158)
(±0.005%)(318)

Wt. % A	d_4^{25}
100.000	0.87338
98.131	0.87678
95.807	0.88140
92.183	0.88752
87.436	0.89598

935. B = C₁₂H₁₀
Diphenyl (158)
(±0.005%)(318, 336)

Wt. % A	d_4^{25}
100.000	0.87253
98.036	0.87600
94.794	0.88037
92.054	0.88240
90.305	0.88678
87.051	0.89146
84.823	0.89256
84.661	0.89495
76.870	0.90578
70.205	0.91138
60.653	0.92786

936. B = C₁₂H₁₀N₂
Azobenzene (158)
(±0.005%)(318)

Wt. % B	d_4^{25}
0.000	0.87339
1.946	0.87673
3.819	0.88009
7.292	0.88600
13.643	0.89750

937. B = C₁₂H₁₄O₅
Ethyl monobenzoylglycerate
(90)

938. B = C₁₂H₁₆O₂
Amyl benzoate (199)¹

939. B = C₁₃H₁₀O
Benzophenone
(±0.01%)(33)

Wt. % A	d_4^{30}
100.000	0.86833
98.516	0.87119
95.899	0.87640
88.941	0.89052

940. B = C₁₃H₁₀O₃
Salol (292)²

941. B = C₁₄H₈O₂
Anthraquinone
(±0.01%)(297, 317)

Wt. % A	d_4^t	t
99.89	0.8900	0
99.74	0.8794	20
99.65	0.8692	30
99.51	0.8591	40
99.30	0.8439	50
99.04	0.8389	60
98.66	0.8288	70
98.25	0.8190	80

942. B = C₁₄H₈O₂
Phenanthraquinone (297, 1.2
317, 1.2)

943. B = C₁₄H₁₀
Anthracene
(±0.01%)(297, 317)

Wt. % A	d_4^t	t
99.40	0.9008	0
99.03	0.8909	10
98.59	0.8812	20
98.01	0.8717	30
97.29	0.8627	40
96.38	0.8541	50
95.11	0.8460	60
93.46	0.8374	70
92.30	0.8347	75

944. B = C₁₄H₁₀
Phenanthrene (158)
(±0.01%)(318)

a	10^3b
(15°-70°)	
100.00 Wt. % A	
0.88441	1.081(t - 15)
95.970 Wt. % A	
0.89174	1.058(t - 15)
(15°-60°)	
92.770 Wt. % A	
0.89807	1.046(t - 15)
(20°-70°)	
86.285 Wt. % A	
0.90588	1.019(t - 20)

945. B = C₁₄H₁₀O₂
Benzil (158)
(±0.005%)(318)

Wt. % A	d_4^{25}
100.000	0.87338
98.106	0.87764
94.313	0.88646
94.052	0.88690
87.748	0.90169
82.948	0.91334

946. B = C₁₄H₁₂O₂
Benzyl benzoate
(±0.01%)(22)

t	d_4^t
100 Wt. % A	
5	0.8939
15	0.8832
25	0.8725
40	0.8565
60	0.8347
75	0.8083
75 Wt. % A	
5	0.9468
15	0.9363
25	0.9263
40	0.9106
60	0.8904
75	0.8750
50 Wt. % A	
5	1.0016
10	0.9980
15	0.9925
25	0.9825
40	0.9687
60	0.9560
75	0.9359

t	d_4^t
25 Wt. % A	
5	1.0640
15	1.0550
25	1.0454
40	1.0325
60	1.0148
75	1.0015
0 Wt. % A	
5	1.1134
15	1.1249
25	1.1163
40	1.0780
60	1.0870
80	1.0546
90	1.0604
100	1.0571

947. B = C₁₅H₁₈O₇
Diethyl monobenzoyltartrate
(89)

948. B = C₁₆H₁₁N₃O₇
Naphthalene picrate (148)¹

949. B = C₁₆H₂₂O₄
d-Octyl hydrogen phthalate
(±0.05%)(72)

Wt. % A	d_4^{25}
93.82	0.8836
89.29	0.8837?
88.84	0.8866
80.71	0.9046
80.56	0.9054

950. B = C₁₆H₂₂O₄
l-Octyl hydrogen phthalate
(72)¹

951. B = C₁₆H₂₂O₄
dl-Octyl hydrogen phthalate
(5.86-18.29 Wt. % B)(72)
 $d_4^{25} = (0.8826 + 0.021537$
(Wt. % B - 5.86)) ± 0.05%

952. B = C₁₆H₂₄O₃S
Menthyl benzenesulfonate
(212)¹

953. B = C₁₆H₃₂O₂
Palmitic acid (158)

954. B = C₁₈H₁₆O₆
Methyl *d*-dibenzoylglycerate
(90)

955. B = C₁₈H₃₆O₂
Stearic acid (158)

956. B = C₁₉H₁₆
Triphenylmethane (158)
(±0.005%)(318)

Wt. % A	d_4^{25}
100.000	0.87339
98.447	0.87612
97.499	0.87774
93.205	0.88488

957. B = C₂₀H₂₆O₃S
Menthyl naphthalene-β-
sulfonate (212)¹

958. B = C₂₀H₃₈O₂
Ethyl oleate (158)

959. B = C₂₄H₄₂O₆
Di-*l*-menthyl *l*-tartrate
(±0.05%)(214)

a	10^3b
(18.5°-27.0°)	
97.269 Wt. % A	
0.8821	1.012(t - 18.5)
(17.75°-30.15°)	
94.606 Wt. % A	
0.8860	1.040(t - 17.75)

960. B = C₂₄H₄₂O₆
l-Menthyl *d*-tartrate
(±0.05%)(226)

a	10^3b
(10.50°-39.75°)	
98.363 Wt. % A	
0.8911	1.060(t - 10.50)
(9.4°-37.2°)	
92.583 Wt. % A	
0.8993	1.004(t - 9.4)

961. B = C₂₈H₄₆O₈
l-Menthyl diacetyl-*l*-tartrate
(±0.05%)(214)

a	10^3b
(17.75°-30.50°)	
97.938 Wt. % A	
0.8833	1.090(t - 17.75)
(17.85°-30.10°)	
94.781 Wt. % A	
0.8878	1.053(t - 17.85)
(15°-142°)	
0.000 Wt. % A	
1.0557	0.802(t - 15)

962. B = C₂₈H₄₆O₈
l-Menthyl diacetyl-*dl*-tartrate
(19°-28.8°)(±0.05%)(215)

a	10^3b
5.204 Wt. % B	
0.8865	1.041(t - 19)

963. B = C₅₁H₉₈O₆
Tripalmitin
(±0.05%)(332)

a	10^3b
(18.1°-41.0°)	
100.00 Wt. % A	
0.8799	1.057(t - 18.1)
(25°-50°)	
98.02 Wt. % A	
0.8735	1.036(t - 25)
95.93 Wt. % A	
0.8745	1.048(t - 25)
92.22 Wt. % A	
0.8753	1.036(t - 25)
(70°-107.2°)	
0.00 Wt. % A	
0.8752	0.710(t - 70)

964. B = C₅₇H₁₁₀O₆
Tristearin
(±0.05%)(332)

a	10^3b
(18.1°-41.0°)	
100.00 Wt. % A	
0.8799	1.057(t - 18.1)

C₆H₆—(Continued)
 B = C₅₇H₁₁₀O₆—(Continued)
 a | 10³b
 (25°–50°)

97.92 Wt. % A
 0.8734 | 0.968(*t* – 25)

(70°–113.2°)
 0.00 Wt. % A

0.8689 | 0.628(*t* – 70)

964.5 B = *l*-Turpentine
 (0.025 %)(^{123, 124, 289})

Wt. % A | *d*₄²⁰

0.000 | 0.86723

20.077 | 0.86975

39.999 | 0.87272

60.027 | 0.87774

79.573 | 0.88390

100.000 | 0.89144

Wt. % A | *d*₄¹⁵

0.000 | 0.86153

20.077 | 0.86351

39.999 | 0.86625

60.027 | 0.87087

79.573 | 0.87660

100.000 | 0.88369

(0.05 %)(^{60, 170, 342})

Wt. % A | *d*₄²⁰

0.00 | 0.8629

10.08 | 0.8634

22.07 | 0.8644

34.94 | 0.8656

48.95 | 0.8677

63.10 | 0.8705

77.04 | 0.8738

90.02 | 0.8771

100.00 | 0.8803

(0.025 %)(^{123, 124, 289})

Wt. % A | *d*₄²²

0.000 | 0.85590

20.077 | 0.85767

39.999 | 0.85987

60.027 | 0.86412

79.573 | 0.86944

100.000 | 0.87611

v. also 20, 55, 88, 108, 145, 162,
 203, 245, 250, 264, 284, 303,
 307, 322, 345, 364, 408, 498,
 512, 542, 547, 552, 560, 564,
 569, 582, 593, 597, 609, 612,
 620, 651, 657, 661, 672, 704,
 729, 739, 744, 754, 758, 760.5,
 776, 777, 789, 793, 799, 819,
 818.5, 823, 866, 1267, 1269,
 1271, 1278, 1279, 1281

C₆H₆BrN

o-Bromoaniline

965. B = C₇H₁₄O₂

Isoamyl acetate (³⁰⁶)¹

C₆H₆BrN

p-Bromoaniline

966. B = C₇H₁₄O₂

Isoamyl acetate (³⁰⁶)¹

v. also 409

C₆H₆ClN

o-Chloroaniline

967. B = C₇H₁₄O₂

Isoamyl acetate (³⁰⁶)¹

C₆H₆ClN

m-Chloroaniline

968. B = C₇H₁₄O₂

Isoamyl acetate (³⁰⁶)¹

C₆H₆ClN

p-Chloroaniline

969. B = C₇H₁₄O₂

Isoamyl acetate (³⁰⁶)¹

v. also 410

C₆H₆IN

p-Iodoaniline

970. B = C₇H₁₄O₂

Isoamyl acetate (³⁰⁶)¹

C₆H₆N₂O₂

o-Nitroaniline

971. B = C₇H₁₄O₂

Isoamyl acetate (³⁰⁶)¹

C₆H₆N₂O₂

m-Nitroaniline

972. B = C₇H₁₄O₂

Isoamyl acetate (³⁰⁶)¹

v. also 411

C₆H₆N₂O₂

p-Nitroaniline, *v.* 412

C₆H₆O, Phenol

973. B = C₆H₇N

Aniline (^{156, 307})¹

(±0.01 %)(²⁷)

Wt. % B | *d*₄²⁰

100.00 | 1.0219

92.06 | 1.0276

84.69 | 1.0326

76.66 | 1.0380

68.72 | 1.0434

60.61 | 1.0485

52.44 | 1.0531

46.19 | 1.0568

37.50 | 1.0610

30.48 | 1.0643

22.98 | 1.0674

14.98 | 1.0703

7.72 | 1.0728

0.00 | 1.0749

Wt. % B | *d*₄³⁰

100.00 | 1.0131

92.42 | 1.0185

84.04 | 1.0242

76.67 | 1.0292

68.35 | 1.0347

60.86 | 1.0394

52.83 | 1.0442

46.00 | 1.0448

38.16 | 1.0520

30.72 | 1.0556

23.14 | 1.0589

15.20 | 1.0616

7.50 | 1.0645

Wt. % B

0.00

Wt. % B

100.00

92.42

84.04

76.67

68.35

60.86

52.83

46.00

38.16

30.72

23.14

15.20

7.50

0.00

Wt. % B

100.00

92.42

84.04

76.67

68.35

60.86

52.83

46.00

38.16

30.72

23.14

15.20

7.50

0.00

Wt. % B

100.00

92.42

84.04

76.67

68.35

60.86

52.83

46.00

38.16

30.72

23.14

15.20

7.50

0.00

Wt. % B

100.00

92.06

84.69

76.66

68.72

60.61

52.44

46.19

37.50

30.48

22.98

14.98

7.72

0.00

974. B = C₆H₅N₂

Phenylhydrazine

(±0.1 %)(³⁰⁷)

*d*₄³⁰

1.0667

*d*₄⁴⁰

1.0045

1.0099

1.0156

1.0206

1.0260

1.0307

1.0355

1.0394

1.0434

1.0470

1.0503

1.0530

1.0560

1.0583

*d*₄⁶⁰

0.9872

0.9925

0.9982

1.0032

1.0086

1.0133

1.0180

1.0220

1.0259

1.0296

1.0330

1.0358

1.0388

1.0414

*d*₄⁸⁰

0.9700

0.9752

0.9809

0.9858

0.9911

0.9959

1.0005

1.0047

1.0085

1.0122

1.0156

1.0185

1.0215

1.0242

*d*₄¹²⁵

0.9289

0.9343

0.9391

0.9437

0.9483

0.9527

0.9571

0.9606

0.9648

0.9690

0.9727

0.9762

0.9795

0.9828

Wt. % A

100.0

79.8

59.8

49.9

46.3

37.2

19.6

0.0

*d*₄⁵⁰

1.048

1.056

1.065

1.0

Wt. % A		980. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (305) ¹		Wt. % A		a	
0.00	$d_4^{79.8}$	981. B = C ₈ H ₁₁ N Dimethylaniline (±0.01 %)(27)		0.00	$d_4^{59.9}$	10 ^{3b} (38.5°–78.8°)	
9.85	0.9366	Wt. % A		7.93	0.9235	14.79 Wt. % B	
20.67	0.9471	0.00		16.61	0.9326	1.0786 | 0.883(t – 38.5)	
29.86	0.9574	9.07		24.60	0.9426	(21.4°–99.8°)	
38.57	0.9665	17.30		32.71	0.9520	23.85 Wt. % B	
46.25	0.9750	23.94		41.46	0.9619	1.1049 | 0.916(t – 21.4)	
55.09	0.9820	33.08		49.19	0.9724	(11.9°–99.2°)	
62.70	0.9898	40.39		56.14	0.9818	48.20 Wt. % B	
71.11	0.9965	48.27		63.95	0.9899	1.1403 | 0.875(t – 11.9)	
80.19	1.0031	55.75		70.99	0.9991	(14.6°–83.4°)	
89.76	1.0099	62.82		78.83	1.0069	64.78 Wt. % B	
100.00	1.0170	69.97		86.08	1.0171	1.1663 | 0.972(t – 14.6)	
Wt. % A		78.14		93.19	1.0256	(16.1°–64.7°)	
0.00	$d_4^{99.9}$	85.39		100.00	1.0335	74.39 Wt. % B	
9.85	0.9190	92.76		Wt. % A		1.1753 | 0.969(t – 16.1)	
20.67	0.9296	100.00		0.00	d_4^{80}	(13.5°–82.1°)	
29.86	0.9399	Wt. % A		7.93	0.9160	79.24 Wt. % B	
38.57	0.9489	0.00		16.61	0.9259	1.1835 | 0.963(t – 13.5)	
46.25	0.9575	9.07		24.60	0.9353	983. B = C ₉ H ₇ N	
55.09	0.9645	17.30		32.71	0.9450	Quinoline (±0.01 %)(27)	
62.70	0.9723	23.94		41.46	0.9553	Wt. % A	
71.11	0.9795	33.08		49.19	0.9645	0.00	$d_4^{9.8}$
80.19	0.9856	40.39		56.14	0.9726	7.54	1.1003
89.76	0.9924	48.27		63.95	0.9817	14.56	1.1020
100.00	0.9995	55.75		70.99	0.9895	22.73	1.1036
Wt. % A		55.75		78.83	0.9997	29.76	1.1055
0.00	d_4^{125}	62.82		86.08	1.0082	37.52	1.1070
9.85	0.8963	69.97		93.19	1.0162	45.08	1.1077
20.67	0.9069	78.14		100.00	1.0242	53.20	1.1073
29.86	0.9173	85.39		Wt. % A		60.30	1.1056
38.57	0.9262	92.76		0.00	d_4^{126}	68.21	1.1029
46.25	0.9349	100.00		9.07	0.8680	76.88	1.0993
55.09	0.9419	Wt. % A		17.30	0.8777	83.37	1.0949
62.70	0.9496	0.00		23.94	0.8864	92.06	1.0915
71.11	0.9567	7.93		33.08	0.8940	100.00	1.0874
80.19	0.9628	16.61		40.39	0.9041	Wt. % A	
89.76	0.9696	24.60		48.27	0.9128	0.00	$d_4^{20.1}$
100.00	0.9766	32.71		55.75	0.9217	7.54	1.0924
Wt. % A		41.46		62.82	0.9303	14.56	1.0943
0.00	d_4^{150}	49.19		69.97	0.9388	22.73	1.0959
16.62	0.8735	56.14		78.14	0.9472	29.76	1.0976
23.11	0.8899	63.95		85.39	0.9564	37.52	1.0991
34.42	0.8962	70.99		92.76	0.9648	45.08	1.0998
38.24	0.9070	78.83		100.00	0.9734	53.20	1.0993
45.61	0.9173	86.08		Wt. % A		60.30	1.0976
56.31	0.9265	93.19		0.00	d_4^{177}	68.21	1.0949
65.69	0.9342	100.00		9.07	0.8227	76.88	1.0913
76.25	0.9422	Wt. % A		17.30	0.8320	83.37	1.0868
79.43	0.9444	0.00		23.94	0.8405	92.06	1.0834
86.34	0.9492	7.93		33.08	0.8474	100.00	1.0790
100.00	0.9572	16.61		40.39	0.8569	Wt. % A	
Wt. % A		24.60		48.27	0.8648	0.00	$d_4^{29.9}$
0.00	d_4^{175}	32.71		55.75	0.8734	7.77	1.0850
16.62	0.8503	41.46		62.82	0.8818	14.92	1.0869
23.11	0.8669	49.19		69.97	0.8896	21.96	1.0885
34.42	0.8733	56.14		78.14	0.8979	29.82	1.0903
38.24	0.8843	63.95		85.39	0.9070	37.14	1.0916
45.61	0.8879	70.99		92.76	0.9153	44.62	1.0923
56.31	0.8944	78.83		100.00	0.9238	52.31	1.0916
65.69	0.8990	86.08		Wt. % A		59.89	1.0900
76.25	0.9073	93.19		0.00	$d_4^{29.9}$	67.92	1.0873
79.43	1.0073	100.00		7.77	1.0850	75.75	1.0836
86.34	1.0166	Wt. % A		14.92	1.0869	83.49	1.0794
100.00	1.0243	0.00		21.96	1.0885	91.79	1.0755
Wt. % A		7.93		29.82	1.0903	100.00	1.0710
0.00	d_4^{175}	16.61		37.14	1.0916	982. B = C ₈ H ₁₄ O ₆	
16.62	0.8503	24.60		44.62	1.0923	Ethyl tartrate	
23.11	0.8669	32.71		52.31	1.0916	(±0.075 %)(224)	
34.42	0.8733	41.46		59.89	1.0900		
38.24	0.8843	49.19		67.92	1.0873		
45.61	0.8879	56.14		75.75	1.0836		
56.31	0.8944	63.95		83.49	1.0794		
65.69	0.8990	70.99		91.79	1.0755		
76.25	0.9073	78.83		100.00	1.0710		
79.43	1.0073	86.08					
86.34	1.0166	93.19					
100.00	1.0243	100.00					

C₆H₆O.—(Continued)
B = C₉H₇N.—(Continued)

Wt. % A	d_4^{40}
0.00	1.0772
7.77	1.0791
14.92	1.0807
21.96	1.0822
29.82	1.0837
37.14	1.0842
44.62	1.0836
52.31	1.0819
59.89	1.0792
67.92	1.0754
75.75	1.0712
83.49	1.0671
91.79	1.0627
100.00	1.0583
<hr/>	
Wt. % A	d_4^{50}
0.00	1.0614
7.77	1.0634
14.92	1.0650
21.96	1.0665
29.82	1.0678
37.14	1.0681
44.62	1.0674
52.31	1.0657
59.89	1.0628
67.92	1.0589
75.75	1.0547
83.49	1.0502
91.79	1.0457
100.00	1.0414
<hr/>	
Wt. % A	d_4^{80}
0.00	1.0458
7.77	1.0478
14.92	1.0494
21.96	1.0508
29.82	1.0517
37.14	1.0520
44.62	1.0513
52.31	1.0496
59.89	1.0465
67.92	1.0425
75.75	1.0382
83.49	1.0335
91.79	1.0288
100.00	1.0242
<hr/>	
Wt. % A	d_4^{125}
0.00	1.0085
7.54	1.0103
14.56	1.0119
22.73	1.0133
29.76	1.0140
37.52	1.0139
45.08	1.0127
53.20	1.0099
60.30	1.0065
68.21	1.0021
76.88	0.9969
83.37	0.9927
92.06	0.9876
100.00	0.9828

Wt. % A	d_4^{175}
0.00	0.9673
7.54	0.9687
14.56	0.9698
22.73	0.9707
29.76	0.9705
37.52	0.9696
45.08	0.9678
53.20	0.9643
60.30	0.9602
68.21	0.9550
76.88	0.9492
83.37	0.9445
92.06	0.9389
100.00	0.9337

984. B = C₁₀H₉N
 α -Naphthylamine
 ($\pm 0.1\%$)(³⁰⁷)

Wt. % A	d_4^{30}
100.0	1.067
48.0	1.094
43.5	1.097
20.9	1.106
<hr/>	
Wt. % A	d_4^{50}
100.0	1.048
48.0	1.075
43.5	1.076
20.9	1.092
7.5	1.102
0.0	1.108

985. B = C₁₂H₁₁N
 Diphenylamine (³⁰⁷)¹
 ($\pm 0.01\%$)(²⁷)

$d_4^{30} = (1.0799 - 0.03133$ Wt. % A)	
$d_4^{40} = (1.0721 - 0.03138$ Wt. % A)	
$d_4^{61} = (1.0542 - 0.03138$ Wt. % A)	
$d_4^{81} = (1.0377 - 0.03144$ Wt. % A)	

986. B = C₁₂H₁₈O₃
 Diethyl diacetyltartrate
 ($\pm 0.25\%$)(²⁷³)

a	10 ^{3b}
<hr/>	
(55.6°–99.0°)	
100.00 Mol % A	
1.045	0.9194($t - 55.6$)
87.36 Mol % A	
1.070	0.8986($t - 55.6$)
71.25 Mol % A	
1.117	0.9701($t - 55.6$)
58.80 Mol % A	
1.098	0.9677($t - 55.6$)
36.35 Mol % A	
1.111	0.9837($t - 55.6$)
15.02 Mol % A	
1.121	1.0410($t - 55.6$)
<hr/>	
(67.3°–99.0°)	
0.00 Mol % A	
1.109	0.8958($t - 67.3$)

987. B = C₁₃H₁₃N
 Diphenylmethylaniline
 ($\pm 0.01\%$)(²⁷)

Wt. % A	$d_4^{9.8}$
0.00	1.0594
4.92	1.0604
9.48	1.0614
17.18	1.0631
27.69	1.0656
36.92	1.0678
48.42	1.0707
56.87	1.0727
67.10	1.0752
78.79	1.0781
89.30	1.0808
100.00	1.0838
<hr/>	
Wt. % A	$d_4^{20.1}$
0.00	1.0514
4.92	1.0522
9.48	1.0531
17.18	1.0547
27.69	1.0571
36.92	1.0592
48.42	1.0620
56.87	1.0640
67.10	1.0664
78.79	1.0692
89.30	1.0719
100.00	1.0749
<hr/>	
Wt. % A	d_4^{30}
0.00	1.0438
4.98	1.0449
10.21	1.0461
20.04	1.0483
35.34	1.0518
49.87	1.0551
62.12	1.0580
73.58	1.0606
82.22	1.0626
90.05	1.0644
100.00	1.0667
<hr/>	
Wt. % A	d_4^{40}
0.00	1.0359
4.98	1.0369
10.21	1.0379
20.04	1.0401
35.34	1.0435
49.87	1.0467
62.12	1.0495
73.58	1.0520
82.22	1.0541
90.05	1.0559
100.00	1.0583
<hr/>	
Wt. % A	d_4^{60}
0.00	1.0198
4.98	1.0207
10.21	1.0217
20.04	1.0237
35.34	1.0269
49.87	1.0301
62.12	1.0328
73.58	1.0354
82.22	1.0373
90.05	1.0391
100.00	1.0414
<hr/>	
Wt. % A	d_4^{80}
0.00	1.0040
4.98	1.0048
10.21	1.0058

Wt. % A	d_4^{80}
20.04	1.0076
35.34	1.0104
49.87	1.0136
62.12	1.0164
73.58	1.0188
82.22	1.0206
90.05	1.0223
100.00	1.0242

v. also 109, 413, 513, 667, 705,
800, 824, 874, 1282, 1283

C₆H₆O₂

Resorcinol, *v.* 414, 621

C₆H₇N

Aniline

988. B = C₆H₅IN

Aniline hydroiodide
 (to 20.48 Wt. % B)(²⁶⁶)
 $d_4^{25} = (1.018 + 0.05225$
 Wt. % B) $\pm 0.25\%$

989. B = C₇H₆O₂

Benzoic acid

($\pm 0.005\%$)(³¹⁹)

Wt. % A	$d_4^{12.87}$
100.000	1.02780
98.222	1.03044
94.694	1.03581
91.005	1.04158
87.831	1.04665

990. B = C₇H₈

Toluene

($\pm 0.075\%$)(¹²²)

Wt. % A	d_4^{20}
100.00	1.0208
87.45	0.9989
80.84	0.9878
60.07	0.9541
40.95	0.9241
25.43	0.9007
0.00	0.8654
<hr/>	
a	
10 ^{3b}	
<hr/>	
(25°–90°)	
100.00 Wt. % A	
1.0170	0.838($t - 25$)
<hr/>	
70.28 Wt. % A	
0.9658	0.867($t - 25$)
<hr/>	
37.14 Wt. % A	
0.9133	0.898($t - 25$)
<hr/>	
(25°–75°)	
0.00 Wt. % A	
0.8599	0.890($t - 25$)

991. B = C₇H₈O

m-Cresol

($\pm 0.25\%$)(¹⁵⁶)

Mol % A	d_4^0
0	1.049
25	1.050
45	1.049
50	1.048
55	1.048
75	1.044
100	1.039

$(\pm 0.25\%)^{(312)}$	
Mol % A	d_4^{25}
100.0	1.018
70.0	1.022
62.6	1.024
53.9	1.026
45.1	1.029
36.9	1.030
22.2	1.030
0.0	1.031
$(\pm 0.25\%)^{(156)}$	
Mol % A	$d_4^{61.5}$
0	1.003
25	1.002
45	1.001
50	1.000
55	0.999
75	0.995
100	0.987
992. B = C ₇ H ₈ O	
<i>p</i> -Cresol $(\pm 0.1\%)^{(307)}$	
Wt. % A	d_4^{25}
100.0	1.020
70.0	1.022
46.4	1.027
37.3	1.028
20.5	1.028
10.0	1.029
Wt. % A	d_4^{50}
100.0	0.992
70.0	0.997
46.4	1.001
37.3	1.004
20.5	1.005
10.0	1.005
0.0	1.005
993. B = C ₇ H ₉ N	
<i>o</i> -Toluidine	
(0–100 Wt. % A) $^{(122)}$	
$d_4^{54} = (0.9700 + 0.03216$	
Wt. % A) $\pm 0.075\%$	
994. B = C ₇ H ₁₄ O ₂	
Isoamyl acetate $(306)^1$	
995. B = C ₈ H ₉ NO	
Acetanilide $(292)^2$	
996. B = C ₈ H ₁₀	
Xylene (149) $(\pm 0.25\%)^{(46)}$	
Wt. % A	d_4^0
100.0	1.039
87.0	1.014
63.6	0.975
54.4	0.960
37.4	0.938
19.4	0.917
0.0	0.909
997. B = C ₈ H ₁₀ N ₄ O ₂	
Caffeine $(292)^2$	
998. B = C ₈ H ₁₀ O	
Phenetole	
(0 – 100 Wt. % B) $(\pm 0.01\%)$	
(27)	
$d_4^0 = (1.0390 - 0.03538$	
Wt. % B)	

$d_4^{9.9} = (1.0303 - 0.03543$	
Wt. % B)	
$d_4^{20.2} = (1.0214 - 0.03548$	
Wt. % B)	
$d_4^{29.6} = (1.0134 - 0.03554$	
Wt. % B)	
$d_4^{40} = (1.0045 - 0.03561$	
Wt. % B)	
$d_4^{60} = (0.9872 - 0.03573$	
Wt. % B)	
$d_4^{80} = (0.9700 - 0.03589$	
Wt. % B)	
999. B = C ₈ H ₁₁ N	
Dimethylaniline	
$(\pm 0.1\%)^{(122)}$	
Wt. % A	$d_4^{64.7}$
100.00	0.9916
92.01	0.9858
80.41	0.9776
53.92	0.9598
35.58	0.9484
17.40	0.9377
11.76	0.9344
0.00	0.9278
1000. B = C ₈ H ₁₄ O ₆	
Ethyl tartrate	
$(\pm 0.05\%)^{(225)}$	
a	10 ³ b
$(15.1^\circ - 25.1^\circ)$	
0.00 Wt. % B	
1.0262 | 0.86(<i>t</i> – 15.1)	
$(17.2^\circ - 70.7^\circ)$	
7.66 Wt. % B	
1.0373 | 0.878(<i>t</i> – 17.2)	
$(12.7^\circ - 81.8^\circ)$	
23.98 Wt. % B	
1.0699 | 0.915(<i>t</i> – 12.7)	
$(12.2^\circ - 86.1^\circ)$	
66.29 Wt. % B	
1.1474 | 0.959(<i>t</i> – 12.2)	
1001. B = C ₁₀ H ₁₃ NO ₂	
Phenacetine (292)	
1002. B = C ₁₀ H ₁₄ N ₂	
Nicotine $(343)^1$	
1003. B = C ₁₂ H ₁₁ N	
Diphenylamine	
$(\pm 0.075\%)^{(112)}$	
93.55 Wt. % A	
<i>t</i>	d_4^t
25	1.0212
60	0.9922
90	0.9644
<i>v. also</i> 21, 56, 204, 323, 415,	
514, 570, 622, 673, 706, 730,	
808, 814, 816, 825, 867, 875,	
973	
C ₆ H ₈ IN	
Aniline hydroiodide	
<i>v.</i> 988	
C ₆ H ₈ N ₂	
<i>o</i> -Phenylenediamine	
1004. B = C ₇ H ₁₄ O ₂	
Isoamyl acetate $(306)^1$	

C ₆ H ₈ N ₂	
<i>m</i> -Phenylenediamine	
1005. B = C ₇ H ₁₄ O ₂	
Isoamyl acetate $(306)^1$	
C ₆ H ₈ N ₂	
Phenylhydrazine	
<i>v.</i> 809, 974	
C ₆ H ₈ O ₇	
Citric acid	
1006. B = C ₇ H ₁₄ O ₂	
Amyl acetate $(296)^{1,2}$	
<i>v. also</i> 416, 674	
C ₆ H ₁₀ O	
Mesityl oxide	
1007. B = C ₇ H ₁₄ O ₂	
Isoamyl acetate	
$(\pm 0.05\%)^{(69)}$	
Wt. % B	d_4^{25}
100.00	0.8664
91.42	0.8644
86.85	0.8635
0.00	0.8549
C ₆ H ₁₀ O ₃	
Ethyl acetoacetate	
1008. B = C ₆ H ₁₄	
Hexane (158)	
1009. B = C ₇ H ₉ N	
2, 6-Lutidine	
$(\pm 0.05\%)^{(71)}$	
Wt. % A	d_4^{25}
0.00	0.9324
10.90	0.9413
32.63	0.9598
52.01	0.9769
88.55	1.0112
100.00	1.0222
1010. B = C ₈ H ₁₄ O ₆	
Ethyl tartrate	
$(\pm 0.05\%)^{(223)}$	
a	10 ³ b
$(14^\circ - 71.5^\circ)$	
10.47 Wt. % B	
1.0509 | 1.018(<i>t</i> – 14)	
$(14^\circ - 50.5^\circ)$	
25.08 Wt. % B	
1.0749 | 1.013(<i>t</i> – 14)	
$(15.2^\circ - 54.2^\circ)$	
50.19 Wt. % B	
1.1169 | 1.026(<i>t</i> – 15.2)	
1011. B = C ₁₀ H ₈	
Naphthalene (158)	
1012. B = C ₁₂ H ₁₀ N ₂	
Azobenzene (158)	
1013. B = C ₁₄ H ₁₀	
Phenanthrene (158)	
1014. B = C ₁₆ H ₃₂ O ₂	
Palmitic acid (158)	
<i>v. also</i> 57, 285, 346, 417, 598,	
707, 876	
C ₆ H ₁₀ O ₄	
Ethyl oxalate	

1015. B = C ₈ H ₁₀	
Xylené $(199)^1$	
<i>v. also</i> 146, 877	
C ₆ H ₁₀ O ₄	
Methyl <i>l</i> -α-acetoxypropionate	
<i>v.</i> 257, 826	
C ₆ H ₁₀ O ₆	
Methyl tartrate	
<i>v.</i> 827	
C ₆ H ₁₀ O ₈	
Citric acid monohydrate	
1016. B = C ₇ H ₁₄ O ₂	
Amyl acetate $(296)^{1,2}$	
<i>v. also</i> 110, 418, 623, 675, 761	
C ₆ H ₁₂	
Cyclohexane	
<i>v.</i> 286	
C ₆ H ₁₂ O ₂	
Caproic acid	
1017. B = C ₁₀ H ₁₆ O	
Camphor $(323, 342)$	
C ₆ H ₁₂ O ₂	
Amyl formate	
1018. B = C ₈ H ₁₀	
Xylene $(199)^1$	
<i>v. also</i> 748, 878	
C ₆ H ₁₂ O ₂	
Butyl acetate	
1019. B = C ₈ H ₁₀	
Xylene $(199)^1$	
<i>v. also</i> 879	
C ₆ H ₁₂ O ₂	
<i>d</i> -β-Butyl acetate	
<i>v.</i> 58	
C ₆ H ₁₂ O ₂	
Isobutyl acetate	
1020. B = C ₆ H ₁₂ O ₂	
Ethyl butyrate	
$(0^\circ - 40^\circ)(\pm 0.025\%)^{(24)}$	
a	10 ³ b
100.00 Wt. % A	
0.8920 | 1.049 <i>t</i>	
50.63 Wt. % A	
0.8959 | 1.050 <i>t</i>	
0.00 Wt. % A	
0.8997 | 1.053 <i>t</i>	
1021. B = C ₆ H ₁₂ O ₂	
Ethyl isobutyrate	
$(0^\circ - 40^\circ)(\pm 0.025\%)^{(24)}$	
a	10 ³ b
100.00 Wt. % A	
0.8920 | 1.049 <i>t</i>	
50.711 Wt. % A	
0.8914 | 1.067 <i>t</i>	
0.00 Wt. % A	
0.8906 | 1.075 <i>t</i>	

C₆H₁₂O₂—(Continued)

1022. B = C ₇ H ₁₄ O ₂	
Ethyl isovalerate	
(0°–40°)(±0.025%)(²⁴)	
a	10 ³ b
100.000 Wt. % A	
0.8920	1.049 <i>t</i>
53.512 Wt. % A	
0.8888	1.023 <i>t</i>
0.00 Wt. % A	
0.8854	0.994 <i>t</i>

C₆H₁₂O₂

Ethyl butyrate	
1023. B = C ₆ H ₁₂ O ₂	
Ethyl isobutyrate	
a	10 ³ b
(to 40°)(±0.025%)(²⁴)	
0.000 Wt. % A	
0.89060	1.075 <i>t</i>
51.368 Wt. % A	
0.89530	1.065 <i>t</i>
100.000 Wt. % A	
0.89970	1.053 <i>t</i>

1024. B = C₆H₁₄
n-Hexane

(to 40°)(±0.025%)(²⁴)	
a	10 ³ b
100.000 Wt. % B	
0.68720	0.9025 <i>t</i>
49.961 Wt. % B	
0.79305	0.9913 <i>t</i>
0.000 Wt. % B	
0.89970	1.0525 <i>t</i>

1025. B = C₈H₁₀
Xylene (¹⁹⁹)¹**1026. B = C₁₀H₈**
Naphthalene (¹⁵⁸)**1027. B = C₁₂H₁₀N₂**
Azobenzene (¹⁵⁸)*v. also* 778, 880, 1020, 1265**C₆H₁₂O₂**

Ethyl isobutyrate

1028. B = C₆H₁₄
n-Hexane

(to 40°)(±0.025%)(²⁴)	
a	10 ³ b
100.000 Wt. % B	
0.68720	0.9025 <i>t</i>
50.289 Wt. % B	
0.78760	1.0050 <i>t</i>
0.000 Wt. % B	
0.89060	1.0750 <i>t</i>

1029. B = C₆H₁₄

Isohexane

(to 40°)(±0.025%)(²⁴)	
a	10 ³ b
100.000 Wt. % B	
0.67790	0.9125 <i>t</i>
50.405 Wt. % B	
0.78250	1.0050 <i>t</i>
0.000 Wt. % B	
0.89060	1.0750 <i>t</i>

v. also 1021, 1023**C₆H₁₂O₃**

Paraldehyde

1030. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(²²³)

(20°–67.5°)

49.99 Wt. % B

a	10 ³ b
1.0974	1.189(<i>t</i> – 20)

1031. B = C₈H₂₀INTetraethylammonium iodide
(³³¹)¹**1032. B = C₁₀H₈**Naphthalene (¹⁵⁸)**1033. B = C₁₂H₁₀N₂**Azobenzene (¹⁵⁸)**1034. B = C₁₆H₃₂O₂**Palmitic acid (¹⁵⁸)*v. also* 59, 323.5, 418.5, 553,
590, 624, 762, 779, 828, 881**C₆H₁₃NO**

Caproamide

v. 419**C₆H₁₄**

Hexane

1035. B = C₆H₁₄

Isohexane

(to 40°)(±0.025%)(²⁴)

a	10 ³ b
100.000 Wt. % A	
0.68720	0.9025 <i>t</i>
50.805 Wt. % A	
0.68260	0.9075 <i>t</i>
0.000 Wt. % A	
0.67790	0.9125 <i>t</i>

1036. B = C₇H₁₄O₂
Propyl butyrate (¹⁵⁸)**1037. B = C₈H₁₈***n*-Octane (³⁵¹, ³⁵²)¹**1038. B = C₁₀H₈**Naphthalene (¹⁵⁸)**1039. B = C₁₀H₁₄**

Durene

(±0.005%)(³¹⁸)

Wt. % A	<i>d</i> ₄ ²⁵
100.000	0.67207
97.435	0.67642
90.168	0.68869
86.070	0.68918

1040. B = C₁₀H₁₆O
d-Camphor (⁵³)**1041. B = C₁₀H₁₇Cl**(31.6–70.87 Wt. % B)(⁵³)
*d*₄¹⁵ = (0.756 + 0.0234*t*)
(Wt. % B – 31.6) ± 0.5%**1042. B = C₁₂H₁₀**Acenaphthene (¹⁵⁸)(to 4.712 Wt. % B)(³¹⁸)
*d*₄²⁵ = (0.67207 + 0.022825
Wt. % B) ± 0.005%**1043. B = C₁₂H₁₀**Diphenyl (¹⁵⁸)(to 6.434 Wt. % B)(³¹⁸)*d*₄²⁵ = (0.67207 + 0.022556

Wt. % B) ± 0.005%

1044. B = C₁₂H₁₀N₂Azobenzene (¹⁵⁸)(to 3.671 Wt. % B)(³¹⁸)*d*₄²⁵ = (0.67207 + 0.022711

Wt. % B) ± 0.005%

1045. B = C₁₆H₃₂O₂Palmitic acid (¹⁵⁸)**1046. B = C₁₈H₃₆O₂**Stearic acid (¹⁵⁸)**1047. B = C₁₉H₁₆**Triphenylmethane (¹⁵⁸)(to 3.011 Wt. % B)(³¹⁸)*d*₄²⁵ = (0.67207 + 0.022729

Wt. % B) ± 0.005%

v. also 324, 347, 515, 583, 599,
625, 756, 762.5, 780, 882, 1008,
1024, 1028**C₆H₁₄**

Isohexane

v. 749, 1029, 1035**C₆H₁₆ClN**

Triethylammonium iodide

v. 111**C₇H₅N**

Benzonitrile

1048. B = C₈H₂₀INTetraethylammonium iodide
(³²⁹, ¹ ³³¹)¹**1049. B = C₁₂H₂₈IN**Tetrapropylammonium iodide
(³³⁰, ¹ ³³¹)¹*v. also* 420, 662**C₇H₅NS**

Phenyl thiocyanate

1050. B = C₁₀H₇Br*α*-Bromonaphthalene (²⁸⁹, ³⁵³)**1051. B = C₁₀H₁₂O**Anethole (²⁸⁹, ³⁵³)*v. also* 60, 699**C₇H₅N₃O₆**

Trinitrotoluene

v. 112, 883, 1281**C₇H₆N₂O₄**

2, 4-Dinitrotoluene

1052. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(²⁰⁸)a | 10³b

(72.3°–100.0°)

24.94 Wt. % B

1.2706 | 1.000(*t* – 72.3)

(19.3°–131.2°)

100.00 Wt. % B

1.2062 | 1.023(*t* – 19.3)**C₇H₆N₂O₄**

2, 6-Dinitrotoluene

1053. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(²⁰⁸)a | 10³b

(63.3°–80.5°)

24.75 Wt. % B

1.2788 | 1.023(*t* – 63.3)

(19.3°–131.2°)

100.00 Wt. % B

1.2062 | 1.023(*t* – 19.3)**C₇H₆O**

Benzaldehyde

1054. B = C₈H₉NOAcetanilide (²⁹²)²**1055. B = C₈H₁₀N₄O₂**Caffeine (²⁹²)²**1056. B = C₈H₁₄O₆**Ethyl tartrate (²⁰⁹)(±0.05%)(²¹⁸)a | 10³b

(18.5°–31.65°)

0.00 Wt. % B

1.0516 | 0.905(*t* – 18.5)

(18.05°–42.4°)

9.97 Wt. % B

1.0649 | 0.904(*t* – 18.05)

(17.7°–31.15°)

35.50 Wt. % B

1.1049 | 0.967(*t* – 17.7)**1057. B = C₁₀H₁₃NO₂**Phenacetine (²⁹²)²**1058. B = C₁₂H₂₈IN**Tetrapropylammonium iodide
(³³⁰)¹*v. also* 61, 154, 884**C₇H₆O₂**

Salicylaldehyde

1059. B = C₇H₁₄O₂Isoamyl acetate (³⁰⁵)¹**1060. B = C₈H₁₄O₆**

Ethyl tartrate

(±0.05%)(²⁰⁹)a | 10³b

(–23° to + 223.5°)

100.00 Wt. % B

1.2482 | 1.007(*t* + 23)

(18.5°–100°)

20.21 Wt. % B

1.1750 | 0.987(*t* – 18.5)*v. also* 700**C₇H₆O₂**

Benzoic acid

1061. B = C₇H₈Toluene (²⁹⁶)^{1,2}**1062. B = C₇H₁₄O₂**Amyl acetate (²⁹⁶)^{1,2}**1063. B = C₈H₁₀**Xylene (²⁹⁶)^{1,2}

1064. B = C ₉ H ₇ N Quinoline (±0.1 %)(¹²) a | 10 ³ b (99°–125°) 100.0 Mol % B 1.031 | 0.847(<i>t</i> – 99) 80.0 Mol % B 1.052 | 0.847(<i>t</i> – 99) 50.0 Mol % B 1.082 | 0.808(<i>t</i> – 99) 33.4 Mol % B 1.096 | 0.847(<i>t</i> – 99)	C ₇ H ₇ NO Benzamide <i>v.</i> 423, 709	a | 10 ³ b (20.4°–99.4°) 51.19 Wt. % B 1.1764 | 1.000(<i>t</i> – 20.4) (19.3°–131.2°) 100.00 Wt. % B 1.2062 | 1.023(<i>t</i> – 19.3)	(±0.05 %)(¹⁵⁷) <i>d</i> ₄ ^t = 0 Mol % B 0.8825(1 – 0.03982 <i>t</i>) 25 Mol % B 0.9272(1 – 0.03991 <i>t</i>) 50 Mol % B 0.9676(1 – 0.03881 <i>t</i>) 75 Mol % B 1.0088(1 – 0.03928 <i>t</i>) 100 Mol % B 1.0493(1 – 0.03711 <i>t</i>)
1065. B = C ₉ H ₁₂ Cumene (296) ^{1,2}	C ₇ H ₇ NO Formanilide <i>v.</i> 710	1075. B = C ₁₂ H ₁₈ O ₈ Diethyl diacetyltartrate (±0.25 %)(²⁷³) (67.3°–99.0°) a | 10 ³ b 0.00 Mol % B 1.100 | 0.852(<i>t</i> – 67.3) 14.18 Mol % B 1.073 | 0.820(<i>t</i> – 67.3) 31.49 Mol % B 1.109 | 0.978(<i>t</i> – 67.3) 49.80 Mol % B 1.107 | 0.915(<i>t</i> – 67.3) 66.49 Mol % B 1.110 | 0.978(<i>t</i> – 67.3) 84.77 Mol % B 1.111 | 0.978(<i>t</i> – 67.3) 100.00 Mol % B 1.109 | 0.915(<i>t</i> – 67.3)	1080. B = C ₇ H ₉ N <i>o</i> -Toluidine (±0.075 %)(¹²²) Wt. % A | <i>d</i> ₄ ^{54.5} 0.00 | 0.9700 7.49 | 0.9588 17.69 | 0.9437 35.88 | 0.9177 58.59 | 0.8867 79.34 | 0.8592 88.84 | 0.8478 100.00 | 0.8340
1065.5. B = Turpentine (296) ¹ <i>v. also</i> 22, 62, 113, 421, 676, 708, 763, 829, 885, 989	C ₇ H ₇ NO ₂ <i>o</i> -Nitrotoluene 1072. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05 %)(²⁰⁸) a | 10 ³ b (16.0°–100.5°) 0.00 Wt. % B 1.1672 | 0.943(<i>t</i> – 16.0) (12.0°–101.0°) 5.00 Wt. % B 1.1717 | 0.950(<i>t</i> – 12.0) (14.1°–101.0°) 10.00 Wt. % B 1.1711 | 0.961(<i>t</i> – 14.1) (15.0°–101.0°) 25.01 Wt. % B 1.1749 | 0.972(<i>t</i> – 15.0) (19.4°–101.6°) 50.21 Wt. % B 1.1799 | 0.999(<i>t</i> – 19.4) (19.3°–131.2°) 100.00 Wt. % B 1.2062 | 1.023(<i>t</i> – 19.3)	<i>v. also</i> 425	1081. B = C ₇ H ₉ N <i>p</i> -Toluidine (299) ^{1,2}
C ₇ H ₆ O ₃ Salicylic acid 1066. B = C ₇ H ₈ Toluene (296) ^{1,2}	1073. B = C ₁₆ H ₂₆ O ₈ Isobutyl diacetyl- <i>d</i> -tartrate (±0.05 %)(²⁰⁹) a | 10 ³ b (16.6°–99.7°) 24.694 Wt. % B 1.1453 | 0.959(<i>t</i> – 16.6) (16.05°–99.3°) 58.860 Wt. % B 1.1187 | 0.941(<i>t</i> – 16.05) (–21° to +99°) 100.000 Wt. % B (±0.1 %) 1.1220 | 0.936(<i>t</i> + 21)	C ₇ H ₇ NO ₂ <i>p</i> -Nitrotoluene 1076. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05 %)(²⁰⁸) a | 10 ³ b (53.9°–93.4°) 20.3 Mol % B 1.1297 | 0.960(<i>t</i> – 53.9) (45.7°–77.0°) 48.5 Mol % B 1.1486 | 1.006(<i>t</i> – 45.7) (19.3°–131.2°) 100.00 Mol % B 1.2062 | 1.023(<i>t</i> – 19.3)	1082. B = C ₇ H ₁₆ Heptane (61)
1067. B = C ₇ H ₁₄ O ₂ Amyl acetate (296) ^{1,2}	<i>v. also</i> 64, 424	<i>v. also</i> 65, 426, 516	1083. B = C ₈ H ₈ O ₂ Phenylacetic acid (±0.075 %)(¹⁷²) (15°–100°) a | 10 ³ b 86.04 Wt. % A 0.8998 | 0.912(<i>t</i> – 15) 100.00 Wt. % A 0.8706 | 0.912(<i>t</i> – 15)
1068. B = C ₈ H ₁₀ Xylene (296) ^{1,2}	C ₇ H ₇ NO Benz- <i>anti</i> -aldoxime 1070. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05 %)(²¹⁹) a | 10 ³ b (44.6°–74.0°) 79.90 Wt. % B 1.1645 | 1.017(<i>t</i> – 44.6) (18°–40.0°) 49.62 Wt. % B 1.1603 | 0.937(<i>t</i> – 18) (22°–77.7°) 22.82 Wt. % B 1.1312 | 0.880(<i>t</i> – 22) (21.5°–44.5°) 10.37 Wt. % B 1.1197 | 0.848(<i>t</i> – 21.5) (18°–38.0°) 0.00 Wt. % B 1.1122 | 0.830(<i>t</i> – 18)	C ₇ H ₇ NO ₃ <i>o</i> -Nitroanisole 1077. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05 %)(²²⁴) a | 10 ³ b (17.7°–59.7°) 9.79 Wt. % B 1.2469 | 1.001(<i>t</i> – 17.7) (14.9°–66.4°) 21.17 Wt. % B 1.2440 | 1.017(<i>t</i> – 14.9)	1084. B = C ₈ H ₉ NO Acetanilide (292) ²
1069. B = C ₉ H ₁₂ Cumene (296) ^{1,2}	C ₇ H ₇ NO ₂ <i>m</i> -Nitrotoluene 1074. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05 %)(²⁰⁸) a | 10 ³ b (17.5°–99.6°) 0.00 Wt. % B 1.1598 | 0.936(<i>t</i> – 17.5) (15.5°–99.0°) 5.00 Wt. % B 1.1625 | 0.942(<i>t</i> – 15.5) (18.3°–99.4°) 9.99 Wt. % B 1.1612 | 0.948(<i>t</i> – 18.3) (18.4°–99.6°) 25.00 Wt. % B 1.1667 | 0.970(<i>t</i> – 18.4)	C ₇ H ₈ 1079. B = C ₇ H ₈ O <i>m</i> -Cresol	1085. B = C ₈ H ₁₀ Ethylbenzene (351, 352) ¹ (±0.025 %)(²⁴) (to 40°) a | 10 ³ b 0.000 Wt. % A 0.89130 | 0.8863 <i>t</i> 52.670 Wt. % A 0.88805 | 0.9075 <i>t</i> 100.000 Wt. % A 0.88450 | 0.9300 <i>t</i>
1069.5. B = Turpentine (296) ¹ <i>v. also</i> 23, 63, 114, 422, 677, 764, 830, 886	C ₇ H ₇ NO Benz- <i>syn</i> -aldoxime 1071. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05 %)(²¹⁹) a | 10 ³ b (21.1°–43.50°) 90.11 Wt. % B 1.1973 | 1.023(<i>t</i> – 21.1)		1086. B = C ₈ H ₁₀ N ₄ O ₂ Caffeine (292) ²
			1087. B = C ₈ H ₁₁ N Dimethylaniline (±0.075 %)(¹²²) Wt. % A | <i>d</i> ₄ ²⁰ 0.00 | 0.9558 12.95 | 0.9436 20.86 | 0.9363 39.81 | 0.9188 59.53 | 0.9011 79.24 | 0.8836 86.12 | 0.8775 100.00 | 0.8655

C₇H₈—(Continued)

1088. B = C ₈ H ₁₄ O ₆	
Ethyl tartrate	
(±0.05%)(205)	
a	10 ³ b
(18.77°–28.65°)	
0.00 Wt. % B	
0.8663	0.931(<i>t</i> – 18.77)
(20.72°–31.02°)	
2.01 Wt. % B	
0.8691	0.932(<i>t</i> – 20.72)
(20.15°–41.65°)	
5.02 Wt. % B	
0.8768	0.939(<i>t</i> – 20.15)
(19.80°–50.60°)	
9.98 Wt. % B	
0.8895	0.952(<i>t</i> – 19.80)
(21.32°–48.85°)	
24.99 Wt. % B	
0.9284	0.977(<i>t</i> – 21.32)
(18°–99°)	
49.18 Wt. % B	
1.0064	1.002(<i>t</i> – 18)
(20.5°–82.6°)	
59.91 Wt. % B	
1.0409	0.997(<i>t</i> – 20.5)
(19°–99°)	
69.99 Wt. % B	
1.0792	1.010(<i>t</i> – 19)
1089. B = C ₉ H ₁₀ O ₂	
Ethyl benzoate (158)	
(±0.0075%)(171)	
Wt. % A	<i>d</i> ₄ ²⁵
0.000	1.04528
15.279	1.01164
47.316	0.94666
76.166	0.89419
100.000	0.85448
1090. B = C ₉ H ₁₂	
1, 2, 4-Trimethylbenzene	
(±0.025%)(24)	
(to 40°)	
a	10 ³ b
0.000 Wt. % A	
0.89260	0.8088 <i>t</i>
55.381 Wt. % A	
0.88760	0.8638 <i>t</i>
100.000 Wt. % A	
0.88450	0.9300 <i>t</i>
1091. B = C ₉ H ₁₃ N	
Dimethyl- <i>o</i> -toluidine	
(±0.05%)(122)	
Wt. % A	<i>d</i> ₄ ^{54.6}
100.00	0.8342
90.88	0.8400
71.56	0.8518
46.70	0.8644
39.88	0.8725
19.78	0.8858
14.06	0.8895
0.00	0.8990
1092. B = C ₁₀ H ₈	
Naphthalene (54, 12991)	
(±0.005%)(319)	

Wt. % B	<i>d</i> ₄ ^{12.87}
0.000	0.87233
1.243	0.87416
5.064	0.88968
7.257	0.88289
20.286	0.90208
(±0.075%)(172)	

Wt. % A	<i>d</i> ₄ ¹⁵
100.00	0.8712
93.59	0.8802
90.80	0.8837
88.03	0.8883
77.13	0.9046
(±0.005%)(85)	

Wt. % B	<i>d</i> ₄ ¹⁸
0.000	0.86701
4.953	0.87416
9.090	0.88022
14.660	0.88850
20.133	0.89672
25.093	0.90424

1093. B = C₁₀H₁₃NO₂
Phenacetine (292)²1094. B = C₁₀H₁₄
Durene
(±0.005%)(318)

Wt. % A	<i>d</i> ₄ ²⁵
100.000	0.86137
97.057	0.86145
93.388	0.86197
93.229	0.86213
83.597	0.86387

1095. B = C₁₀H₁₆O₄
Camphoric acid (296)^{1,2}1096. B = C₁₂H₁₀
Acenaphthene (158, 2991)
(±0.005%)(318)

Wt. % A	<i>d</i> ₄ ²⁵
100.000	0.86137
97.902	0.86526
94.657	0.87144
90.754	0.87858
82.571	0.89481

1097. B = C₁₂H₁₀
Diphenyl (158)
(±0.005%)(318)

Wt. % A	<i>d</i> ₄ ²⁵
100.000	0.86137
97.372	0.86528
95.680	0.86777
91.063	0.87496
88.072	0.87911
75.834	0.89864

1098. B = C₁₂H₁₀N₂
Azobenzene
(±0.005%)(318)

Wt. % B	<i>d</i> ₄ ²⁵
0.000	0.86137
2.841	0.86680
4.462	0.86968
8.547	0.87739
10.719	0.88128

1099. B = C₁₃H₁₀O₃
Salol (292)²1100. B = C₁₄H₁₀
Phenanthrene (158, 2991)
(±0.01%)(318)
(to 70°)

a	10 ³ b
100.000 Wt. % A	
0.87047	0.938(<i>t</i> – 15)
96.902 Wt. % A	
0.87665	0.929(<i>t</i> – 15)
94.793 Wt. % A	
0.88121	0.926(<i>t</i> – 15)
89.516 Wt. % A	
0.89230	0.912(<i>t</i> – 15)
78.557 Wt. % A	
0.91592	0.884(<i>t</i> – 15)

1101. B = C₁₄H₁₀O₂
Benzil (158)
(±0.005%)(318)

Wt. % A	<i>d</i> ₄ ²⁵
100.000	0.86137
97.217	0.86787
95.824	0.87124
93.451	0.87744
83.056	0.90238
77.966	0.91521

1102. B = C₁₈H₃₆O₂
Stearic acid (296)^{1,2}1103. B = C₁₉H₁₆
Triphenylmethane (158)
(±0.005%)(318)

Wt. % A	<i>d</i> ₄ ²⁵
100.000	0.86137
96.147	0.86858
92.613	0.87462
88.843	0.88138
82.114	0.89433

1103.5. B = Turpentine
(0.0075%)(171)

Wt. % A	<i>d</i> ₄ ²⁵
0.000	0.85720
6.791	0.85698
20.654	0.85588
53.701	0.85432
75.091	0.85404
100.000	0.85430

v. also 24, 66, 115, 251, 265, 267, 287, 325, 427, 517, 543, 565, 610, 626, 678, 755, 781, 790, 794, 801, 831, 887, 975, 990, 1061, 1066, 1266, 1280

C₇H₈OBenzyl alcohol
1104. B = C₇H₁₄O₂
Isoamyl acetate (305)¹1105. B = C₈H₁₄O₆
Ethyl tartrate
(±0.05%)(225)

a	10 ³ b
(17.0°–46.9°)	
10.00 Wt. % B	
1.0635	0.763(<i>t</i> – 17.0)

a | 10³b
(20°–101.1°)

23.38 Wt. % B
1.0818 | 0.833(*t* – 20)

v. also 679, 888, 1265

C₇H₈O, *o*-Cresol

1106. B = C₇H₈O
m-Cresol
(0–100 Wt. % A)
*d*₄^{15.5} = (1.039 +
0.03129 Wt. % A) ±
0.25% (86)

1107. B = C₇H₁₄O₂
Isoamyl acetate (305)¹

v. also 428, 711, 832, 889, 976,
1282

C₇H₈O, *m*-Cresol

1108. B = C₇H₈O
p-Cresol (86)

1109. B = C₇H₉N
o-Toluidine (312)
(±0.05%)(157)

*d*₄^t =
100 Mol % A
1.0493(1 – 0.03711*t*)
75 Mol % A
1.0452(1 – 0.03782*t*)
50 Mol % A
1.0386(1 – 0.03802*t*)
25 Mol % A
1.0276(1 – 0.03794*t*)
0 Mol % A
1.0151(1 – 0.03808*t*)

1110. B = C₇H₁₄O₂
Isoamyl acetate (305)¹1111. B = C₈H₁₁N
Dimethylaniline
(±0.05%)(157)

*d*₄^t =
0 Mol % A
0.9742(1 – 0.03868*t*)
25 Mol % A
0.9925(1 – 0.03846*t*)
50 Mol % A
1.0113(1 – 0.03815*t*)
75 Mol % A
1.0313(1 – 0.03795*t*)
100 Mol % A
1.0493(1 – 0.03711*t*)

v. also 712, 890, 977, 991, 1079,
1106, 1282, 1283

C₇H₈O, *p*-Cresol

1112. B = C₇H₁₄O₂
Isoamyl acetate (305)¹

v. also 713, 978, 992, 1108, 1283

C₇H₈O

Anisole

1113. B = C₇H₁₄O₂
Isoamyl acetate (305)¹

1114. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(224)	
\bar{t}	d_4
9.99 Wt. % B	
17.5	1.0142
25.4	1.0064
24.62 Wt. % B	
14.9	1.0424
32.5	1.0261
45.5	1.0130
55.5	1.0033
49.85 Wt. % B	
15.8	1.0932
25.6	1.0834
<i>v. also</i> 205, 429, 1265	
C ₇ H ₈ O ₆ Gallic acid monohydrate 1115. B = C ₇ H ₁₄ O ₂ Amyl acetate (296) ^{1,2}	
<i>v. also</i> 67, 430, 518, 627, 680, 765, 891	
C ₇ H ₉ N 2, 6-Lutidine <i>v.</i> 432, 1009	
C ₇ H ₉ N Methylaniline 1116. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(225)	
a	10 ^{3b}
(14.9°–65.0°)	
9.94 Wt. % B	
1.0069	0.812(<i>t</i> –14.9)
(15.3°–20.0°)	
30.89 Wt. % B	
1.0486	0.872(<i>t</i> –15.3)
<i>v. also</i> 589, 833	
C ₇ H ₉ N <i>o</i> -Toluidine 1117. B = C ₇ H ₉ N <i>p</i> -Toluidine (to 50 Wt. % B)(173)	
d_4^{15}	(1.0030 – 0.03126
Wt. % B) ±0.1%	
(50–56 Wt. % B)	
d_4^{20}	(0.9930 – 0.03216
(Wt. % B – 50)) ±0.1%	
1118. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (306) ¹	
1119. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(225)	
a	10 ^{3b}
(12.6°–47.4°)	
10.93 Wt. % B	
1.0250	0.851(<i>t</i> –12.6)
(15°–58°)	
25.10 Wt. % B	
1.0501	0.889(<i>t</i> –15)
(14.9°–50.5°)	
50.30 Wt. % B	
1.1006	0.927(<i>t</i> –14.9)

<i>v. also</i> 834, 993, 1080, 1109	
C ₇ H ₉ N <i>m</i> -Toluidine 1120. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (306) ¹	
1121. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(225)	
a	10 ^{3b}
(15.5°–43.2°)	
11.66 Wt. % B	
1.0154	0.845(<i>t</i> –15.5)
(16.3°–64.3°)	
24.96 Wt. % B	
1.0407	0.837(<i>t</i> –16.3)
C ₇ H ₉ N <i>p</i> -Toluidine 1122. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (306) ¹	
1123. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(225)	
a	10 ^{3b}
(20°–67.8°)	
24.93 Wt. % B	
1.0350	0.836(<i>t</i> –20)
(16.8°–58.2°)	
49.98 Wt. % B	
1.0919	0.925(<i>t</i> –16.8)
1124. B = C ₁₀ H ₈ Naphthalene (±0.1%)(159)	
Mol % B	d_4^{80}
0	0.9365
10	0.9399
20	0.9434
29	0.9466
40	0.9510
60	0.9592
80	0.9681
90	0.9730
100	0.9777
Mol % B	d_4^{90}
0	0.9283
10	0.9316
20	0.9350
29	0.9384
40	0.9428
60	0.9513
80	0.9596
90	0.9648
100	0.9701
<i>v. also</i> 116, 431, 868, 979, 1081, 1117	
C ₇ H ₉ NO <i>o</i> -Anisidine 1125. B = C ₇ H ₁₄ O ₂ Isoamyl acetate (306) ¹	
C ₇ H ₉ NO ₂ Ammonium benzoate <i>v.</i> 433	

C ₇ H ₉ NO ₂ Phenylammonium formate <i>v.</i> 155	
C ₇ H ₉ NO ₃ Ammonium salicylate <i>v.</i> 434	
C ₇ H ₉ NO ₃ S <i>m</i> -Methoxybenzenesul- fonamide <i>v.</i> 229	
C ₇ H ₁₂ O ₃ Ethyl methylacetoacetate 1128. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(223)	
(13°–41°)(10.23 Wt. % B)	
a	10 ^{3b}
1.0225	1.008(<i>t</i> –13)
C ₇ H ₁₂ O ₄ Ethyl malonate 1127. B = C ₈ H ₁₀ Xylene (199) ¹	
<i>v. also</i> 892	
C ₇ H ₁₄ O ₂ Amyl acetate 1129. B = C ₈ H ₉ NO Acetanilide (292) ²	
1130. B = C ₈ H ₁₀ Xylene (199) ¹	
1131. B = C ₈ H ₁₀ N ₄ O ₂ Caffeine (292) ²	
1132. B = C ₁₀ H ₁₃ NO ₂ Phenacetine (292) ²	
1133. B = C ₁₃ H ₁₀ O ₃ Salol (292) ²	
1134. B = C ₁₈ H ₃₆ O ₂ Stearic acid (296) ^{1,2}	
<i>v. also</i> 519, 1006, 1016, 1062, 1067, 1115, 1265	
C ₇ H ₁₄ O ₂ Isoamyl acetate 1136. B = C ₈ H ₆ Phenylacetylene (69, ¹ 125 ¹)	
1137. B = C ₈ H ₈ Phenylethylene (±0.05%)(69, 125)	
Wt. % A	d_4^{25}
100.00	0.8664
95.30	0.8684
91.61	0.8702
0.00	0.8998
1138. B = C ₈ H ₈ O Acetophenone (±0.05%)(69)	
Wt. % A	d_4^{25}
100.00	0.8664
95.69	0.8731
91.72	0.8744
1139. B = C ₈ H ₈ O ₂ Phenyl acetate (305) ¹	

1140. B = C ₈ H ₈ O ₃ <i>l</i> -Mandelic acid (±0.05%)(72)	
Wt. % A	d_4^{25}
100.00	0.8664
95.28	0.8722
92.07	0.8823
91.45	0.8843
88.61	0.8933
1141. B = C ₈ H ₈ O ₃ <i>dl</i> -Mandelic acid (±0.05%)(72)	
Wt. % A	d_4^{25}
100.00	0.8664
93.88	0.8764
92.36	0.8813
90.14	0.8880
87.12	0.8976
1142. B = C ₈ H ₁₀ Phenylethane (69, ¹ 125 ¹)	
1143. B = C ₈ H ₁₀ O Benzyl methyl ether (305) ¹	
1144. B = C ₈ H ₁₀ O Phenetole (305) ¹	
1145. B = C ₈ H ₁₀ O <i>o</i> -Tolyl methyl ether (305) ¹	
1146. B = C ₈ H ₁₀ O <i>m</i> -Tolyl methyl ether (305) ¹	
1147. B = C ₈ H ₁₀ O <i>p</i> -Tolyl methyl ether (305) ¹	
1148. B = C ₉ H ₆ O ₂ Phenylpropionic acid (to 7.16 Wt. % B)(125)	
d_4^{25}	(0.8664 + 0.02375
Wt. % B) ±0.05%	
1149. B = C ₉ H ₈ O ₂ Cinnamic acid (±0.05%)(125)	
Wt. % A	d_4^{25}
100.00	0.8664
96.11	0.8748
94.98	0.8782
1150. B = C ₉ H ₁₀ O ₂ β -Phenylpropionic acid (±0.05%)(125)	
Wt. % A	d_4^{25}
100.00	0.8664
95.99	0.8754
94.25	0.8776
1151. B = C ₉ H ₁₀ O ₂ Benzyl acetate (305) ¹	
1152. B = C ₉ H ₁₀ O ₃ Ethyl salicylate (305) ¹	
1153. B = C ₉ H ₁₀ O ₃ Ethyl <i>m</i> -hydroxybenzoate (305) ¹	
1154. B = C ₉ H ₁₁ NO ₂ Ethyl <i>p</i> -aminobenzoate (306) ¹	
1155. B = C ₉ H ₁₁ NO ₂ Ethyl anthranilate (306) ¹	

C₇H₁₄O₂—(Continued)1156. B = C₉H₁₄O

Phorone

(±0.05%)(⁶⁹)

Wt. % A	d_4^{25}
100.00	0.8664
91.26	0.8680
85.10	0.8698
0.00	0.8964

1157. B = C₁₀H₈

Naphthalene (158)

1158. B = C₁₀H₈O α -Naphthol (305)¹1159. B = C₁₀H₈O β -Naphthol (305)¹1160. B = C₁₀H₉N α -Naphthylamine (306)¹1161. B = C₁₀H₉N β -Naphthylamine (306)¹1162. B = C₁₀H₁₀O

Benzylideneacetone

(to 9.12 Wt. % B)(⁶⁹) $d_4^{25} = (0.8664 + 0.021623$

Wt. % B) ± 0.05%

1163. B = C₁₀H₁₀O₂

Safrole

(±0.05%)(⁶⁹)

Wt. % A	d_4^{25}
100.00	0.8664
93.46	0.8790
72.70	0.9212
0.00	1.0950

1164. B = C₁₀H₁₀O₂Isosafrole (⁶⁹)¹1165. B = C₁₀H₁₂O

Benzylacetone

(±0.05%)(⁶⁹)

Wt. % A	d_4^{25}
100.00	0.8664
96.35	0.8714
92.08	0.8760

1166. B = C₁₀H₁₂O₂

Eugenol

(±0.05%)(⁶⁹)

Wt. % A	d_4^{25}
100.00	0.8664
87.74	0.8864
80.39	0.9019
0.00	1.0620

1167. B = C₁₀H₁₂O₂

Isoeugenol

(±0.05%)(⁶⁹)

Wt. % A	d_4^{25}
100.00	0.8664
92.34	0.8810
85.49	0.8940
0.00	1.0791

1168. B = C₁₂H₁₀Diphenyl (⁶⁹,¹ 158)(±0.05%)(³¹⁸)

Wt. % A	d_4^{25}
100.00	0.86208
93.052	0.87276
88.565	0.88972

1169. B = C₁₂H₁₁NDiphenylamine (306)¹1170. B = C₁₂H₁₀N₂

Azobenzene (158)

1171. B = C₁₂H₁₂O

Cinnamylideneacetone

(to 2.47 Wt. % B)(⁶⁹) $d_4^{25} = (0.8664 + 0.021539$

Wt. % B) ± 0.05%

1172. B = C₁₃H₁₀O

Benzophenone

(to 6.48 Wt. % B)(⁶⁹) $d_4^{25} = (0.8664 + 0.022127$

Wt. % B) ± 0.05%

1173.5 B = C₁₃H₁₂ODiphenylcarbinol (305)¹1173. B = C₁₃H₂₀O₂Menthyl propiolate (125)¹1174. B = C₁₄H₁₀

Phenanthrene (158)

1175. B = C₁₄H₁₀Diphenylacetylene (125)¹1176. B = C₁₄H₁₂

Diphenylethylene

(to 4.70 Wt. % B)(¹²⁵) $d_4^{25} = (0.8664 + 0.02149$

Wt. % B) ± 0.05%

1177. B = C₁₄H₁₄

Diphenylethane

(to 5.29 Wt. % B) (125)

 $d_4^{25} = (0.8664 + 0.021247$

Wt. % B) ± 0.05%

1178. B = C₁₅H₁₂O

Benzylideneacetophenone

(±0.05%)(⁶⁹)

Wt. % A	d_4^{25}
100.00	0.8664
96.00	0.8768
94.55	0.8790

1179. B = C₁₅H₁₄O

Diphenylacetone

(to 4.84 Wt. % B)(⁶⁹) $d_4^{25} = (0.8664 + 0.021838$

Wt. % B) ± 0.05%

1180. B = C₁₅H₁₄O

Benzylacetophenone

(to 5.10 Wt. % B)(⁶⁹) $d_4^{25} = (0.8664 + 0.021883$

Wt. % B) ± 0.05%

1181. B = C₁₆H₁₄Diphenylbutadiene (125)¹1182. B = C₁₆H₁₈

Diphenylbutane

(±0.05%)(¹²⁵)

Wt. % A	d_4^{25}
100.00	0.8664
98.56	0.8698
96.60	0.8730

1183. B = C₁₇H₁₄O

Dibenzylideneacetone

(to 2.76 Wt. % B)(⁶⁹) $d_4^{25} = (0.8664 + 0.02239$

Wt. % B) ± 0.05%

1184. B = C₁₇H₁₄O

Cinnamylideneacetophenone

(±0.05%)(⁶⁹)

Wt. % A	d_4^{25}
100.00	0.8664
97.90	0.8715
96.69	0.8734

1185. B = C₁₈H₃₆O₂

Stearic acid (158)

1186. B = C₁₉H₁₆OTriphenylcarbinol (305)¹1187. B = C₁₉H₂₆O₂

Menthyl cinnamate

(±0.05%)(¹²⁵)

Wt. % A	d_4^{25}
100.00	0.8664
98.80	0.8684
93.92	0.8732
81.52	0.9101

1188. B = C₁₉H₂₈O₂Menthyl β -phenylpropionate(±0.05%)(¹²⁵)

Wt. % A	d_4^{25}
100.00	0.8664
94.12	0.8713
90.62	0.8755

1189. B = C₂₁H₁₈O

Dicinnamylideneacetone

(±0.05%)(⁶⁹)

Wt. % A	d_4^{25}
100.00	0.8664
99.11	0.8675
98.99	0.8688

v. also 288, 600, 628, 725, 731, 773, 782, 785, 788, 797, 798, 810, 815, 817, 818, 821, 869, 872, 873, 893, 965, 966, 967, 968, 969, 970, 971, 972, 980, 994, 1004, 1005, 1007, 1059, 1104, 1107, 1110, 1112, 1113, 1118, 1120, 1122, 1125

C₇H₁₄O₂

Ethyl valerate

1190. B = C₈H₁₀Xylene (199)¹*v. also* 894C₇H₁₄O₂

Ethyl isovalerate

*v. 1022*C₇H₁₄O₂

Propyl butyrate

1191. B = C₁₀H₈

Naphthalene (158)

1192. B = C₁₂H₁₀N₂

Azobenzene (158)

1193. B = C₁₄H₁₀

Phenanthrene (158)

1194. B = C₁₆H₃₂O₂

Palmitic acid (158)

1195. B = C₁₈H₃₆O₂

Stearic acid (158)

v. also 601, 783, 895, 1036C₇H₁₆

Heptane

1196. B = C₁₀H₇Br α -Bromonaphthalene (61, 236)¹1197. B = C₁₀H₈

Naphthalene

(to 2.483 Wt. % A)(⁵⁴) $d_4^{18} = (0.73383 + 0.022186$

Wt. % A) ± 0.0075%

v. also 68, 117, 289, 371, 802, 896, 1082

C₇H₁₆O

Diethylisopropyl alcohol

v. 897

Ethyl amyl ether

*v. 25, 118, 803*C₈H₅NO₂

Phthalimide

*v. 714*C₈H₆

Phenylacetylene

*v. 1136*C₈H₇N

Benzyl cyanide

1198. B = C₈H₁₀OPhenetole (236)¹1199. B = C₈H₂₀IN

Tetraethylammonium iodide

(329)¹C₈H₈

Phenylethylene

*v. 1137*C₈H₈ClNO*p*-Chloroacetanilide*v. 435*C₈H₈O

Acetophenone

1200. B = C₈H₂₀IN

Tetraethylammonium iodide

(331)¹

v. also 119, 230, 238, 242, 258, 304, 326, 898, 1138

C₈H₈O₂

Anisaldehyde

1201. B = C₁₂H₂₈IN

Tetrapropylammonium iodide

(330)¹C₈H₈O₂

Phenylacetic acid

*v. 1083*C₈H₈O₂

Methyl benzoate

1202. B = C ₉ H ₁₀ O ₂ Ethyl benzoate (±0.01%)(²⁵⁵)	
Wt. % B	d_4^{25}
100.00	1.04171
81.57	1.04917
64.20	1.05637
53.45	1.06081
38.71	1.06732
22.53	1.07420
0.00	1.08433
1203. B = C ₁₀ H ₈ Naphthalene (¹⁵⁸)	
1204. B = C ₁₂ H ₁₀ N ₂ Azobenzene (¹⁵⁸)	
1205. B = C ₁₄ H ₁₀ Phenanthrene (¹⁵⁸)	
<i>v. also</i> 290, 348, 584, 602, 629, 681, 784, 835, 899	
C ₈ H ₈ O ₂ Phenyl acetate <i>v.</i> 1139	
C ₈ H ₈ O ₃ <i>l</i> -Mandelic acid <i>v.</i> 1140 <i>dl</i> -Mandelic acid <i>v.</i> 1141	
C ₈ H ₉ Cl ₃ O ₇ Methyl mono (trichloroacetyl)- tartrate <i>v.</i> 836	
C ₈ H ₉ NO Acetanilide 1206. B = C ₈ H ₁₀ Xylene (²⁹²) ²	
<i>v. also</i> 120, 206, 436, 520, 900, 995, 1054, 1084, 1129	
C ₈ H ₉ NO ₃ <i>o</i> -Nitrophenetole 1207. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(²²⁴)	
<i>a</i>	10^3b
(17.1°–54.3°)	
25.09 Wt. % B	
1.1894	1.000(<i>t</i> – 17.1)
(14.6°–41.0°)	
39.43 Wt. % B	
1.1946	1.016(<i>t</i> – 14.6)
C ₈ H ₁₀ Ethylbenzene 1208. B = C ₉ H ₁₂ Trimethylbenzene (to 40°)(±0.025%)(²⁴)	
<i>a</i>	10^3b
0.000 Wt. % A	
0.89260	0.8088 <i>t</i>
51.999 Wt. % A	
0.89100	0.8450 <i>t</i>
100.000 Wt. % A	
0.89130	0.8863 <i>t</i>

v. also 630, 735, 901, 1085, 1142

C ₈ H ₁₀ <i>o</i> -Xylene 1209. B = C ₈ H ₁₀ <i>m</i> -Xylene (±0.05%)(¹⁵⁷)	
$d_4^t =$	
100.0 Mol % A	
0.8975(1 – 0.03937 <i>t</i>)	
72.9 Mol % A	
0.8941(1 – 0.03955 <i>t</i>)	
26.9 Mol % A	
0.8862(1 – 0.03907 <i>t</i>)	
0.0 Mol % A	
0.8828(1 – 0.03957 <i>t</i>)	
1210. B = C ₈ H ₁₀ <i>p</i> -Xylene (±0.05%)(¹⁵⁷)	
$d_4 =$	
100.0 Mol % A	
0.8975(1 – 0.03937 <i>t</i>)	
81.5 Mol % A	
0.8936(1 – 0.03929 <i>t</i>)	
31.9 Mol % A	
0.8861(1 – 0.03981 <i>t</i>)	
0.0 Mol % A	
0.8787(1 – 0.03989 <i>t</i>)	
1211. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(²⁰⁵)	
<i>a</i>	10^3b
(19.12°–36.34°)	
0.00 Wt. % B	
0.8809	0.842(<i>t</i> – 19.12)
(19.2°–31.7°)	
2.00 Wt. % B	
0.8852	0.848(<i>t</i> – 19.2)
(19.21°–33.47°)	
5.00 Wt. % B	
0.8920	0.848(<i>t</i> – 19.21)
(19.23°–35.85°)	
9.96 Wt. % B	
0.9038	0.860(<i>t</i> – 19.23)
(18.97°–37.76°)	
25.01 Wt. % B	
0.9426	0.910(<i>t</i> – 18.97)
(18.86°–41.90°)	
49.99 Wt. % B	
1.0157	0.955(<i>t</i> – 18.86)
(18.75°–45.58°)	
74.99 Wt. % B	
1.1023	0.991(<i>t</i> – 18.75)
C ₈ H ₁₀ <i>m</i> -Xylene 1212. B = C ₈ H ₁₀ <i>p</i> -Xylene $d_4^t =$	
(±0.05%)(¹⁵⁷)	
100.0 Mol % A	
0.8828(1 – 0.03957 <i>t</i>)	
75.4 Mol % A	
0.8819(1 – 0.03956 <i>t</i>)	
29.2 Mol % A	
0.8798(1 – 0.03979 <i>t</i>)	

0.0 Mol % A 0.8787(1 – 0.03989 <i>t</i>)	
1213. B = C ₈ H ₁₀ N ₄ O ₂ Caffeine (²⁹²) ²	
1214. B = C ₈ H ₁₁ N Dimethylaniline (±0.05%)(¹⁵⁷)	
$d_4^t =$	
0.0 Mol % A	
0.9742(1 – 0.03868 <i>t</i>)	
28.7 Mol % A	
0.9475(1 – 0.03862 <i>t</i>)	
73.4 Mol % A	
0.9095(1 – 0.03938 <i>t</i>)	
100.0 Mol % A	
0.8828(1 – 0.03957 <i>t</i>)	
1215. B = C ₈ H ₁₄ O ₄ Ethyl succinate (¹⁹⁹) ¹	
1216. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(²⁰⁵)	
<i>a</i>	10^3b
(21.37°–42.10°)	
0.00 Wt. % B	
0.8630	0.873(<i>t</i> – 21.37)
(18.42°–30.42°)	
2.00 Wt. % B	
0.8699	0.858(<i>t</i> – 18.42)
(18.35°–33.75°)	
2.41 Wt. % B	
0.8710	0.864(<i>t</i> – 18.35)
(18.4°–33.89°)	
5.10 Wt. % B	
0.8772	0.872(<i>t</i> – 18.4)
(18.80°–31.20°)	
10.00 Wt. % B	
0.8890	0.887(<i>t</i> – 18.80)
(18.01°–32.27°)	
18.82 Wt. % B	
0.9128	0.898(<i>t</i> – 18.01)
(17.66°–30.26°)	
33.12 Wt. % B	
0.9533	0.928(<i>t</i> – 17.66)
(17.8°–100°)	
39.99 Wt. % B	
0.9743	0.942(<i>t</i> – 17.8)
(21.6°–100°)	
59.98 Wt. % B	
1.0371	0.977(<i>t</i> – 21.6)
(18.18°–39.12°)	
74.09 Wt. % B	
1.0931	0.995(<i>t</i> – 18.18)
1217. B = C ₉ H ₁₀ O ₂ Ethyl benzoate (¹⁹⁹) ¹	
1218. B = C ₉ H ₁₀ O ₃ Ethyl salicylate (¹⁹⁹) ¹	
1219. B = C ₁₀ H ₈ Naphthalene (to 17.99 Wt. % A)(¹⁷²)	
$d_4^{15} =$	(0.8678 + 0.001401
Wt. % A) ±0.075%	
1220. B = C ₁₀ H ₁₃ NO ₂ Phenacetine (²⁹²) ²	

1221. B = C ₁₀ H ₁₆ O ₄ Camphoric acid (²⁹⁶) ^{1,2}	
1222. B = C ₁₀ H ₂₀ O ₂ Amyl valerate (¹⁹⁹) ¹	
1223. B = C ₁₂ H ₁₆ O ₂ Amyl benzoate (¹⁹⁹) ¹	
<i>v. also</i> 26, 147, 246, 327, 365, 437, 548, 554, 804, 902, 996, 1015, 1018, 1019, 1025, 1063, 1068, 1127, 1130, 1190, 1206, 1209, 1268, 1270, 1272	
C ₈ H ₁₀ <i>p</i> -Xylene 1224. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(²⁰⁵)	
<i>a</i>	10^3b
(19.50°–40.65°)	
0.00 Wt. % B	
0.8614	0.869(<i>t</i> – 19.50)
(18.8°–30.33°)	
2.00 Wt. % B	
0.8667	0.877(<i>t</i> – 18.8)
(18.1°–37.27°)	
5.00 Wt. % B	
0.8745	0.882(<i>t</i> – 18.1)
(17.95°–42.97°)	
10.10 Wt. % B	
0.8874	0.900(<i>t</i> – 17.95)
(18.42°–31.00°)	
24.98 Wt. % B	
0.9270	0.915(<i>t</i> – 18.42)
(18.59°–43.21°)	
50.09 Wt. % B	
1.0044	0.971(<i>t</i> – 18.59)
(18.43°–34.75°)	
74.99 Wt. % B	
1.0957	0.998(<i>t</i> – 18.43)
<i>v. also</i> 1210, 1212	
C ₈ H ₁₀ N ₄ O ₂ Caffeine <i>v.</i> 521, 766, 903, 997, 1055, 1086, 1131, 1213	
C ₈ H ₁₀ O Benzyl methyl ether <i>v.</i> 1143	
C ₈ H ₁₀ O Phenetole 1225. B = C ₈ H ₁₄ O ₆ Ethyl tartrate (±0.05%)(²²⁴)	
<i>t</i>	d_4
9.99 Wt. % B	
18.6	0.9862
25.8	0.9794
24.96 Wt. % B	
17.9	1.0161
28.1	1.0071
38.3	0.9969
48.4	0.9869
51.73 Wt. % B	
17.7	1.0771
26.5	1.0682

C₈H₁₀O—(Continued)1226. B = C₁₂H₁₀O

Diphenyl ether

(±0.1%)(152)

Mol % B	d_4^{25}
0.00	0.9618
9.94	0.9755
18.73	0.9870
29.63	0.9993
39.98	1.0111
48.95	1.0206
62.69	1.0346
67.47	1.0396
79.28	1.0510
86.33	1.0573
100.00	1.0706

v. also 121, 207, 243, 259, 366,
438, 682, 998, 1144, 1198

C₈H₁₀O*o*-Tolyl methyl ether*v.* 1145*m*-Tolyl methyl ether*v.* 1146*p*-Tolyl methyl ether*v.* 1147**C₈H₁₀O₄**

Diallyl oxalate

v. 904**C₈H₁₁N**

Dimethylaniline

1227. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(225)

a | 10³b

(16.4°–43.0°)

9.40 Wt. % B

0.9774 | 0.850(*t*–16.4)

(15.6°–50.9°)

24.84 Wt. % B

1.0100 | 0.892(*t*–15.6)1228. B = C₁₀H₁₆O*d*-Camphor

(to 60 Wt. % B)(170, 175)

 $d_4^{20} = (0.9576 + 0.0445$

Wt. % B) ±0.025%

v. also 631, 811, 837, 981, 999,
1087, 1111, 1214

C₈H₁₁N

Ethylaniline

v. 838**C₈H₁₂O₄**

Ethyl maleate

1229. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(213)

a | 10³b

(10°–44.2°)

0.00 Wt. % B

1.0789 | 1.009(*t*–10)a | 10³b

(20.3°–44.4°)

20.68 Wt. % B

1.0942 | 1.017(*t*–20.3)**C₈H₁₂O₄**

Ethyl fumarate

1230. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(213)

a | 10³b

(19.05°–48.8°)

79.98 Wt. % B

1.1716 | 1.039(*t*–19.05)

(15.95°–42.05°)

20.68 Wt. % B

1.0843 | 1.039(*t*–15.95)

(20.6°–33.25°)

0.00 Wt. % B

1.0518 | 1.019(*t*–20.6)**C₈H₁₂O₆**

Dimethyl acetylmaleate

v. 122, 208, 905**C₈H₁₄O₃**

Ethyl dimethylacetoacetate

1231. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(223)

a | 10³b

(11.9°–35.8°)

10.28 Wt. % B

1.0350 | 0.984(*t*–11.9)

(13.2°–57.1°)

25.17 Wt. % B

1.0601 | 1.006(*t*–13.2)

(12.6°–51.0°)

50.31 Wt. % B

1.1069 | 0.989(*t*–12.6)**C₈H₁₄O₃**

Ethyl ethylacetoacetate

v. 439, 715, 906**C₈H₁₄O₄**

Ethyl succinate

1232. B = C₈H₁₄O₆

Ethyl tartrate

(±0.05%)(213)

a | 10³b

(19°–31.75°)

0.00 Wt. % B

1.0416 | 1.036(*t*–19)

(19.35°–43.3°)

20.67 Wt. % B

1.0719 | 1.040(*t*–19.35)

(20.1°–42.9°)

79.93 Wt. % B

1.1682 | 1.027(*t*–20.1)*v. also* 632, 907, 1215**C₈H₁₄O₆**Dimethyl *d*-dimethoxysuccinate, *v.* 356, 839**C₈H₁₄O₆**

Ethyl tartrate

1233. B = C₈H₁₄O₆

Methylhexylcarbinol

(±0.075%)(204, 288)

a | 10³b

(18.1°–79.3°)

0.00 Wt. % A

0.8214 | 0.792(*t*–18.1)

(17.8°–81.0°)

5.00 Wt. % A

0.8344 | 0.803(*t*–17.8)

(18.4°–78.8°)

10.00 Wt. % A

0.8473 | 0.810(*t*–18.4)

(18.4°–80.3°)

25.00 Wt. % A

0.8896 | 0.842(*t*–18.4)

(19.1°–81.0°)

50.02 Wt. % A

0.9728 | 0.904(*t*–19.1)

(17.0°–81.6°)

75.01 Wt. % A

1.0776 | 0.953(*t*–17.0)1234. B = C₉H₇N

Quinoline

(±0.05%)(209, 218)

a | 10³b

(14.3°–96.0°)

4.97 Wt. % A

1.1048 | 0.820(*t*–14.3)

(19.5°–99.0°)

10.05 Wt. % A

1.1089 | 0.817(*t*–19.5)

(–13° to +116°)

13.60 Wt. % A

1.1392 | 0.825(*t*+13.0)

(19.8°–99.0°)

25.40 Wt. % A

1.1292 | 0.876(*t*–19.8)

(20.7°–30.6°)

49.98 Wt. % A

1.1585 | 0.778(*t*–20.7)

(–23° to +223.5°)

100.00 Wt. % A

1.2482 | 1.007(*t*+23)1235. B = C₉H₉O

Cinnamic aldehyde

(9.64 Wt. % A)(±0.05%)

(15°–100°)(221)

a | 10³b1.0684 | 0.81(*t*–15)1236. B = C₉H₁₂

Mesitylene

(±0.05%)(205)

a | 10³b

(19.9°–60.05°)

0.00 Wt. % A

0.8598 | 0.824(*t*–19.9)

(19.44°–28.25°)

2.07 Wt. % A

0.8649 | 0.818(*t*–19.44)

(18.22°–62.30°)

5.00 Wt. % A

0.8727 | 0.836(*t*–18.22)a | 10³b

(17.97°–64.32°)

10.01 Wt. % A

0.8852 | 0.852(*t*–17.97)

(19.57°–62.9°)

24.98 Wt. % A

0.9235 | 0.895(*t*–19.57)

(17.05°–39.3°)

36.23 Wt. % A

0.9586 | 0.908(*t*–17.05)

(17.6°–24.82°)

50.00 Wt. % A

1.0017 | 0.938(*t*–17.6)1237. B = C₁₀H₇Br α -Bromonaphthalene

(±0.05%)(217)

Wt. % A | d_4^{20}

0.00 | 1.4881

2.08 | 1.4777

5.00 | 1.4710

20.26 | 1.4189

49.69 | 1.3305

1238. B = C₁₀H₇NO₂ α -Nitronaphthalene

(±0.05%)(208)

a | 10³b

(63.9°–101°)

10.21 Wt. % A

1.2111 | 0.836(*t*–63.9)

(62.4°–98.7°)

25.15 Wt. % A

1.2021 | 0.896(*t*–62.4)

(48.9°–100°)

49.57 Wt. % A

1.1999 | 0.948(*t*–48.9)

(19.3°–131.2°)

100.00 Wt. % A

1.2062 | 1.023(*t*–19.3)1239. B = C₁₀H₈

Naphthalene (±0.05%)(206)

t | d_4^{20}

10.02 Wt. % A

84.1 | 0.9897

99.0 | 0.9780

25.02 Wt. % A

82.5 | 1.0117

99.0 | 0.9980

49.77 Wt. % A

73.8 | 1.0582

82.0 | 1.0508

90.0 | 1.0445

98.5 | 1.0349

74.98 Wt. % A

57.30 | 1.1182

70.65 | 1.1055

80.65 | 1.0955

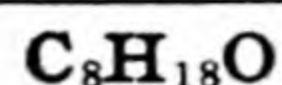
97.70 | 1.0788

v. also 27, 89, 123, 144, 148,
163, 173, 209, 249, 260, 291,
300, 305, 357, 367, 440, 499,
522, 571, 578, 663, 716, 727,
795, 805, 820, 840, 870, 908,
982, 1000, 1010, 1030, 1052, 1053,
1056, 1060, 1070, 1071, 1072,
1074, 1076, 1077, 1078, 1088,

1105, 1114, 1116, 1119, 1121,
1123, 1128, 1207, 1211, 1216,
1224, 1225, 1227, 1229, 1230,
1231, 1232, 1273



n-Octane, *v.* 1037

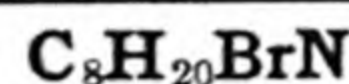


Octyl alcohol

v. 909

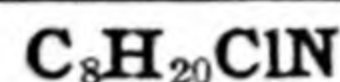
Methylhexylcarbinol

v. 1233



Tetraethylammonium bromide

v. 124



Tetraethylammonium chloride

v. 125



Tetraethylammonium iodide

1240. B = C₁₁H₁₂O₃

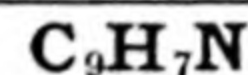
Ethyl benzoylacetate (330)¹

v. also 177, 210, 270, 272, 349,
372, 375, 441, 490, 492, 493,
496, 523, 586, 701, 724, 726,
728, 759, 796, 841, 1031, 1048,
1199, 1200



Phenylpropionic acid

v. 211, 1148



Quinoline

1241. B = C₁₀H₈

Naphthalene (172)¹

1242. B = C₁₂H₂₂O₆

Isobutyl tartrate

(79.93 Wt. % A)(±0.05%)
(209)

<i>t</i>	<i>d</i> ₄ ^t
18.00	1.1002
39.95	1.0831
69.55	1.0579
99.55	1.0330
151.00	0.9880

1243. B = C₁₆H₂₆O₈

Isobutyl diacetyl-*d*-tartrate

(±0.05%)(209)

a | 10³*b*

(15.55°–100.0°)

79.52 Wt. % A

1.0969 | 0.8175

(*t* – 15.55)

(16.50°–99.6°)

25.04 Wt. % A

1.0926 | 0.9030

(*t* – 16.50)

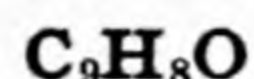
(17.25°–98.9°)

0.00 Wt. % A

1.0863 | 0.9290

(*t* – 17.25)

v. also 812, 871, 983, 1064, 1234



Cinnamic aldehyde

1244. B = C₁₀H₁₂O

Anethole (353)

1245. B = C₂₆H₃₀O₈

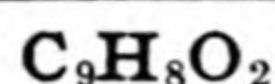
Isobutyl dibenzoyl-*d*-tartrate

(0°–100°)(±0.05%)(221)

9.458 Wt. % B

<i>a</i>	10 ³ <i>b</i>
1.0737	0.763 <i>t</i>

v. also 69, 442, 1235



Cinnamic acid

v. 212, 1149



Ethyl *p*-bromobenzoate

1246. B = C₉H₁₀O₂

Ethyl benzoate

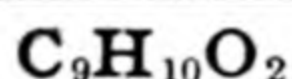
(±0.025%)(255)

Wt. % B	<i>d</i> ₄ ²⁵
100.00	1.0417
61.52	1.1635
39.05	1.2485
38.28	1.2517
22.43	1.3203
0.00	1.4307



Cinnamyl alcohol

v. 213

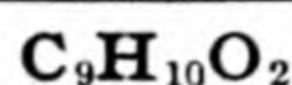


β-Phenylpropionic acid

v. 214, 1150

Benzyl acetate

v. 1151



Ethyl benzoate

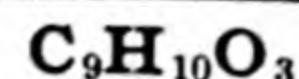
1247. B = C₁₄H₁₂O₂

Benzyl benzoate

(±0.1%)(152)

Mol % B	<i>d</i> ₄ ²⁵
0.00	1.043
10.37	1.052
19.77	1.060
30.94	1.068
40.59	1.076
49.46	1.083
60.55	1.091
70.27	1.097
75.25	1.101
84.50	1.105
95.35	1.110
100.00	1.112

v. also 239, 328, 443, 633, 910,
1089, 1202, 1217, 1246

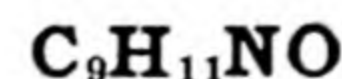


Ethyl salicylate

v. 911, 1152, 1218

Ethyl *m*-hydroxybenzoate

v. 1153

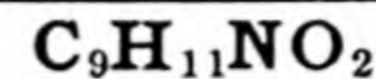


p-Acetoluide

v. 444

Methylacetanilide

v. 126, 445, 524, 912

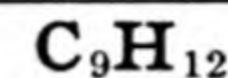


Ethyl *p*-aminobenzoate

v. 1154

Ethyl anthranilate

v. 1155



Cumene

1148. B = C₁₀H₁₆O₄

Camphoric acid (296)^{1,2}

v. also 1065, 1069



Mesitylene

v. 1236

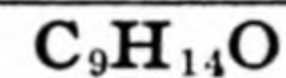
Trimethylbenzene

v. 740, 750, 757, 913, 1090, 1208



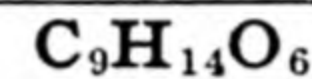
Dimethyl-*o*-toluidine

v. 914, 1091



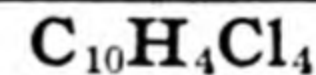
Phorone

v. 915, 1156



Ethyl diacetyl-glycerate

v. 329, 916



Naphthalene tetrachloride

v. 127



Dichloronaphthalene

v. 917



Bromonaphthalene

v. 70, 373, 446, 683, 1050, 1196,
1237



Nitronaphthalene

1249. B = C₁₂H₁₁N

Diphenylamine

(±0.25%)(13)

Wt. % B	<i>d</i> ₄ ⁰
0.00	1.375
9.10	1.348
33.33	1.278
50.00	1.240
66.67	1.211
75.00	1.190
89.90	1.175
100.00	1.156
Wt. % B	<i>d</i> ₄ ¹⁸
0.00	1.368
9.10	1.341
33.33	1.272
50.00	1.234
66.67	1.205
75.00	1.185

Wt. % B

89.90

100.00

Wt. % B

0.00

9.10

33.33

50.00

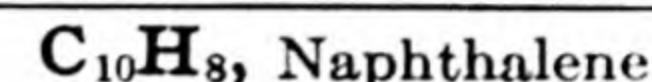
66.67

75.00

89.90

100.00

v. also 918, 1238



1250. B = C₁₀H₉N

Naphthylamine

(±0.25%)(13)

Wt. % A

100.00

88.89

50.00

33.33

25.00

11.11

5.80

0.00

Wt. % A

100.00

88.89

50.00

33.33

25.00

11.11

5.80

0.00

Wt. % A

100.00

88.89

50.00

33.33

25.00

11.11

5.80

0.00

1251. B = C₁₀H₂₀O

l-Menthol

(±0.25%)(273)

Mol % A

100.00

83.51

68.55

50.48

34.37

17.98

8.84

0.00

Mol % A

100.00

83.51

68.55

50.48

34.37

17.98

8.84

0.00

*d*₄¹⁸

1.171

1.152

*d*₄²⁰

1.223

1.202

1.157

1.139

1.105

1.084

1.071

1.057

*d*₄⁰

1.179

1.161

1.151

1.154

1.156

1.160

1.170

1.189

*d*₄¹⁸

1.175

1.156

1.146

1.145

1.146

1.148

1.159

1.177

C₁₀H₈—(Continued)	
1252. B = C ₁₂ H ₁₈ O ₈	
Diethyl diacetyltartrate	
(±0.25%)(²⁷³)	
Mol % A	<i>d</i> ₄ ^{22.2}
100.00	0.9766
82.97	1.0142
66.87	1.0321
49.88	1.0593
32.70	1.0377
16.60	1.0869
0.00	1.0976
Mol % A	<i>d</i> ₄ ^{99.0}
100.00	0.9635
82.97	0.9997
66.87	1.0217
49.88	1.0433
32.70	1.0221
16.60	1.0705
0.00	1.0802
1253. B = C ₁₄ H ₁₀	
Phenanthrene (¹⁵⁸)	
1254. B = C ₁₆ H ₃₂ O ₂	
Palmitic acid (¹⁵⁸)	
<i>v. also</i> 28, 71, 128, 215, 261, 292, 350, 368, 447, 525, 555, 572, 603, 634, 652, 684, 717, 741, 745, 774, 791, 806, 842, 919, 1011, 1026, 1032, 1038, 1092, 1124, 1157, 1191, 1197, 1203, 1219, 1239, 1241, 1280, 1281	
C₁₀H₈Cl₆O₈	
Methyl di(trichloroacetyl)-tartrate	
<i>v. 843</i>	
C₁₀H₈O	
α-Naphthol	
<i>v. 216, 1158</i>	
β-Naphthol	
<i>v. 217, 1159</i>	
C₁₀H₉N	
Naphthylamine	
<i>v. 984, 1160, 1161, 1250</i>	
C₁₀H₁₀O	
Benzylideneacetone	
<i>v. 1162</i>	
C₁₀H₁₀O₂	
Safrole	
<i>v. 1163, 1164</i>	
C₁₀H₁₂	
Tetrahydronaphthalene	
<i>v. 218, 448, 658</i>	
C₁₀H₁₂O	
Anethole	
1255. B = C ₁₀ H ₂₀ O	
<i>L</i> -Menthol	
(55.6°–99.0°)(±0.25%)(²⁷³)	
a	10 ^{3b}
0.00 Mol % A	
0.961	0.8778(<i>t</i> –55.6)

a	10 ^{3b}
9.44 Mol % A	
0.951	0.8802(<i>t</i> –55.6)
33.41 Mol % A	
0.923	0.8271(<i>t</i> –55.6)
51.69 Mol % A	
0.907	0.8570(<i>t</i> –55.6)
66.71 Mol % A	
0.894	0.8179(<i>t</i> –55.6)
84.94 Mol % A	
0.881	0.7879(<i>t</i> –55.6)
100.00 Mol % A	
0.869	0.7326(<i>t</i> –55.6)
<i>v. also</i> 72, 920, 1051, 1244	
C₁₀H₁₂O	
Benzylacetone	
<i>v. 1165</i>	
C₁₀H₁₂O₂	
Eugenol	
<i>v. 1166, 1167</i>	
C₁₀H₁₃NO₂	
Phenacetine	
<i>v. 330, 449, 767, 921, 1001, 1057, 1093, 1132, 1220</i>	
C₁₀H₁₄	
Durene	
<i>v. 129, 635, 844, 922, 1039, 1094</i>	
C₁₀H₁₄N₂	
Nicotine	
<i>v. 130, 174, 219, 331, 358, 450, 526, 573, 664, 685, 923, 1002</i>	
C₁₀H₁₄O	
Thymol, <i>v. 220, 527, 924</i>	
C₁₀H₁₅BrO	
Bromocamphor	
1256. B = C ₆₇ H ₁₁₀ O ₆	
Tristearin	
(±0.25%)(¹³)	
Wt. % A	<i>d</i> ₄ ²
100.00	1.520
88.88	1.459
66.67	1.335
50.00	1.240
33.33	1.156
20.00	1.090
0.00	0.995
Wt. % A	<i>d</i> ₄ ¹⁸
100.00	1.516
88.88	1.453
66.67	1.325
50.00	1.228
33.33	1.145
20.00	1.076
0.00	0.982
Wt. % A	<i>d</i> ₄ ⁹¹
100.00	1.272
88.88	1.222
66.67	1.123
50.00	1.044

Wt. % A	<i>d</i> ₄ ⁹¹
33.33	0.974
20.00	0.916
0.00	0.829
<i>v. also</i> 221, 451, 528, 636, 925	
C₁₀H₁₅N	
Diethylaniline, <i>v. 768, 845</i>	
C₁₀H₁₆	
<i>d</i> -Pinene	
1257. B = C ₁₀ H ₁₆ O	
<i>d</i> -Camphor (¹⁴⁵) ²	
1258. B = C ₁₀ H ₁₆ O	
<i>L</i> -Camphor (¹⁴⁵) ²	
C₁₀H₁₆O	
<i>d</i> -Camphor	
<i>v. 29, 73, 131, 156, 222, 332, 359, 452, 529, 544, 574, 604, 611, 637, 665, 686, 732, 807, 926, 1017, 1040, 1228, 1257, 1279</i>	
<i>L</i> -Camphor	
<i>v. 1258</i>	
C₁₀H₁₆O₄	
Camphoric acid	
1258.1. B = Turpentine (²⁹⁶) ¹	
<i>v. also</i> 74, 132, 453, 687, 769, 846, 927, 1095, 1221, 1248	
C₁₀H₁₇Cl	
Pinene hydrochloride	
<i>v. 688, 1041</i>	
Terpine hydrochloride	
<i>v. 928</i>	
C₁₀H₁₇NO	
<i>d</i> -Camphoroxime	
1258.2. B = Turpentine (¹⁴⁵ , ²⁹⁷) ²	
<i>v. also</i> 752	
C₁₀H₁₇NO	
<i>L</i> -Camphoroxime	
1258.3. B = Turpentine (¹⁴⁵ , ²⁹⁷) ²	
<i>v. also</i> 753	
C₁₀H₁₈	
Decahydronaphthalene	
<i>v. 659</i>	
C₁₀H₁₈O	
Borneol	
<i>v. 223, 454</i>	
C₁₀H₁₈O₃	
Ethyl diethylacetoacetate	
<i>v. 455, 718, 929</i>	
C₁₀H₁₈O₆	
Dipropyl tartrate	
<i>v. 360, 666, 930</i>	

C₁₀H₂₀O	
Menthol	
<i>v. 456, 656, 931</i>	
<i>L</i> -Menthol	
<i>v. 847, 1251, 1255</i>	
C₁₀H₂₀O₂	
Amyl valerate	
<i>v. 932, 1222</i>	
<i>d</i> -β-Octyl acetate	
<i>v. 75, 933</i>	
C₁₀H₂₂O	
Isoamyl ether	
<i>v. 638</i>	
C₁₀H₂₂O₃	
Terpine hydrate	
<i>v. 224</i>	
C₁₀H₂₄CIN	
Diamylammonium chloride	
<i>v. 133</i>	
C₁₁H₁₂O₃	
Ethyl benzoylacetate	
<i>v. 1240</i>	
C₁₁H₁₅NO	
Acetoethyl- <i>o</i> -toluide	
<i>v. 1265</i>	
C₁₂H₁₀	
Acenaphthene	
<i>v. 134, 225, 457, 575, 639, 689, 848, 934, 1042, 1096</i>	
Diphenyl	
<i>v. 76, 135, 640, 690, 849, 935, 1043, 1097, 1168</i>	
C₁₂H₁₀NO	
α-Acenaphthalide	
<i>v. 459</i>	
C₁₂H₁₀N₂	
Azobenzene	
1258.4. B = C ₁₄ H ₁₂	
Stilbene (³⁵⁶)	
1258.5. B = C ₁₄ H ₁₄	
Dibenzyl (³⁵⁶)	
1259. B = C ₁₆ H ₃₂ O ₂	
Palmitic acid (¹⁵⁸)	
1259.5. B = C ₁₃ H ₁₁ N	
Benzalaniline (³⁵⁶)	
<i>v. also</i> 77, 136, 293, 333, 556, 605, 641, 653, 691, 742, 746, 850, 936, 1012, 1027, 1033, 1044, 1098, 1170, 1192, 1204	
C₁₂H₁₀O	
Diphenyl ether	
<i>v. 137, 244, 458, 530, 692, 1226</i>	
C₁₂H₁₁N	
Diphenylamine	
<i>v. 775, 786, 985, 1003, 1169, 1249</i>	

C₁₂H₁₂Cl₆O₈
Ethyl di(trichloroacetyl)tartrate
v. 851

C₁₂H₁₂O
Cinnamylideneacetone
v. 1171

C₁₂H₁₄O₄
Ethyl phthalate
v. 1265

C₁₂H₁₄O₅
Ethyl monobenzoylglycerate
v. 937

C₁₂H₁₆O₂
Amyl benzoate
v. 938, 1223

C₁₂H₁₇NO₂
Ethyl *o*-tolylethylcarbamate
v. 1265

C₁₂H₁₈O₈
Diethyl diacetyltartrate
v. 294, 852, 986, 1075, 1252

C₁₂H₂₂O₆
Isobutyl tartrate
v. 262, 1242

C₁₂H₂₄O₂
Lauric acid
1260. B = C₁₆H₃₂O₂
Palmitic acid
(±0.1%)(³²⁷)

Wt. % A	<i>d</i> ₄ ¹⁵
0.00	0.8457
14.92	0.8468
27.88	0.8477
40.64	0.8484
54.28	0.8493
59.84	0.8497
72.83	0.8507
84.47	0.8514
100.00	0.8527

1261. B = C₁₈H₃₆O₂
Stearic acid
(±0.1%)(³²⁷)

Wt. % A	<i>d</i> ₄ ¹⁵
100.00	0.8527
84.19	0.8510
65.96	0.8494
51.37	0.8481
38.73	0.8470
25.14	0.8455
0.00	0.8436

C₁₂H₂₈IN
Tetrapropylammonium iodide
v. 178, 226, 271, 361, 374, 460,
494, 531, 642, 728.5, 853, 1049,
1058, 1201

C₁₃H₁₀O
Benzophenone
v. 461, 532, 939, 1172, 1275,
1278

C₁₃H₁₀O₃
Salol
v. 334, 462, 770, 940, 1099, 1133

C₁₃H₁₁N
Benzalaniline
v. 1259.5, 1261.5, 1262.2

C₁₃H₁₁NO
Benzanilide
v. 719

C₁₃H₁₂N₂O
Benzoylphenylhydrazine
v. 463

Carbanilide
v. 720

C₁₃H₁₂N₂S
Thiocarbanilide
v. 721

C₁₃H₁₂O
Diphenylcarbinol
v. 1173.5

C₁₃H₁₃N
Benzylaniline
1261.5. B = C₁₃H₁₁N
Benzalaniline (³⁵⁶)

C₁₃H₁₃N
Diphenylmethylamine
v. 813, 987

C₁₃H₂₀O₂
Menthyl propiolate
v. 1173

C₁₄H₈O₂
Anthraquinone
v. 138, 941

Phenanthraquinone
v. 643, 942

C₁₄H₉NO₂
Phthalanil
v. 722

C₁₄H₁₀
Anthracene
v. 943

Diphenylacetylene
v. 1175

C₁₄H₁₀
Phenanthrene
1262. B = C₁₆H₃₂O₂
Palmitic acid (¹⁵⁸)

v. also 30, 295, 351, 464, 557,
585, 606, 644, 693, 747, 854,
944, 1013, 1100, 1174, 1193,
1205, 1253, 1276

C₁₄H₁₀O₂
Benzil
v. 139, 645, 694, 855, 945, 1101

C₁₄H₁₂
Diphenylethylene
v. 1176

C₁₄H₁₂
Stilbene
1262.1. B = C₁₄H₁₄
Dibenzyl (³⁵⁶)

1262.2. B = C₁₃H₁₁N
Benzalaniline (³⁵⁶)

v. also 1258.4

C₁₄H₁₂O₂
Benzyl benzoate
v. 646, 946, 1247

C₁₄H₁₄
Dibenzyl
v. 1258.5, 1262.1
Diphenylethane
v. 1177

C₁₄H₁₄N₂O₃
p-Azoxyanisole
1263. B = C₁₆H₁₈N₂O₃
p-Azoxyphenetole
(0 – 100 Wt. % A)(²⁴¹)
*d*₄¹³⁶ = (1.100 + 0.0347
Wt. % A) ± 0.1 %

C₁₅H₁₂O
Benzylideneacetophenone
v. 1178

C₁₅H₁₄O
Benzylacetophenone
v. 1180
Diphenylacetone
v. 1179

C₁₅H₁₈O₇
Diethyl monobenzoyltartrate
v. 335, 947

C₁₆H₁₁N₃O₇
Naphthalene picrate
v. 948

C₁₆H₁₄
Diphenylbutadiene
v. 1181

C₁₆H₁₈
Diphenylbutane
v. 1182

C₁₆H₁₈N₂O₃
p-Azoxyphenetole
v. 1263

C₁₆H₂₀Cl₆O₈
Isobutyl di(trichloroacetyl)-
tartrate
v. 856

C₁₆H₂₀O₇
Diethyl mono-*o*-toluyltartrate
v. 336

Diethyl mono-*m*-toluyltartrate
v. 337

Diethyl mono-*p*-toluyltartrate
v. 338

C₁₆H₂₂O₄
d-Octyl hydrogen phthalate
v. 949
l-Octyl hydrogen phthalate
v. 950
dl-Octyl hydrogen phthalate
v. 951

C₁₆H₂₄O₃S
Menthyl benzenesulfonate
v. 465, 857, 952

C₁₆H₂₆O₈
Isobutyl diacetyl-*d*-tartrate
v. 263, 858, 1073, 1243

C₁₆H₃₂O₂
Palmitic acid
1264. B = C₁₈H₃₆O₂
Stearic acid
(0 – 100 Wt. % A)(³²⁷)
*d*₄⁷⁵ = (0.8436 + 0.0421
Wt. % A) ± 0.1 %
v. also 466, 533, 647, 695, 953,
1014, 1034, 1045, 1194, 1254,
1259, 1260, 1262

C₁₇H₁₄O
Dibenzylideneacetone
v. 1183
Cinnamylideneacetophenone
v. 1184

C₁₈H₁₆O₆
Methyl dibenzoylglycerate
v. 296, 339, 859, 954

C₁₈H₃₄O₂
Oleic acid
v. 227, 467, 534, 696, 771

C₁₈H₃₆O₂
Stearic acid
v. 31, 78, 140, 468, 535, 607, 648,
697, 772, 860, 955, 1046, 1102,
1134, 1185, 1195, 1261, 1264

C₁₉H₁₆
Triphenylmethane
v. 141, 649, 698, 956, 1047, 1103

C₁₉H₁₆O
Triphenyl carbinol
v. 1186

C₁₉H₁₇N₃
Triphenylguanidine
v. 469

C₁₉H₂₂N₂O
Cinchonicine
v. 470, 536

C₁₉H₂₆O₂
Menthyl cinnamate
v. 1187

$C_{19}H_{28}O_2$ Menthyl β -phenylpropionate v. 1188
$C_{20}H_{13}N_3O_7$ Phenanthrene picrate v. 471, 1277
$C_{20}H_{16}Br_2O_8$ Methyl di (<i>o</i> -bromobenzoyl)- tartrate v. 472, 723
Methyl di (<i>m</i> -bromobenzoyl)- tartrate v. 473
Methyl di (<i>p</i> -bromobenzoyl)- tartrate v. 474
$C_{20}H_{16}Cl_2O_8$ Methyl di (<i>o</i> -chlorobenzoyl)- tartrate v. 475
Methyl di (<i>m</i> -chlorobenzoyl)- tartrate v. 476
Methyl di (<i>p</i> -chlorobenzoyl)- tartrate v. 477
$C_{20}H_{20}O_6$ Methyl di- <i>p</i> -toluylglycerate v. 478, 537
$C_{20}H_{26}O_3S$ Menthyl naphthalene- β -sul- fonate v. 479, 861, 957
$C_{20}H_{38}O_2$ Ethyl oleate v. 297, 352, 958
$C_{21}H_{18}O$ Dicinnamylideneacetone v. 1189
$C_{21}H_{22}O_6$ Ethyl di- <i>p</i> -toluylglycerate v. 480, 538
$C_{24}H_{42}O_6$ <i>l</i> -Menthyl <i>l</i> -tartrate v. 481, 863, 959 <i>dl</i> -Menthyl <i>d</i> -tartrate v. 482, 862, 960
$C_{25}H_{23}N_5O_7$ Piceryl cinchonine v. 539
$C_{26}H_{26}N_2O_2$ Benzoyl cinchonine v. 483, 540
$C_{26}H_{28}N_2O_3S$ <i>p</i> -Toluenesulfonyl cinchonine v. 484, 541

$C_{26}H_{30}O_8$ Isobutyl dibenzoyl- <i>d</i> -tartrate v. 298, 1245
$C_{27}H_{34}N_2O_7$ Quinine salicylate dihydrate v. 485
$C_{27}H_{46}O$ Cholesterol v. 142
$C_{28}H_{46}O_8$ <i>l</i> -Menthyl diacetyl- <i>l</i> -tartrate v. 486, 864, 961 <i>l</i> -Menthyl diacetyl- <i>dl</i> -tartrate v. 487, 865, 962 <i>l</i> -Menthyl diacetyl- <i>d</i> -tartrate v. 488
$C_{51}H_{98}O_6$ Tripalmitin v. 963
$C_{57}H_{110}O_6$ Tristearin v. 964, 1256
Turpentine v. 78.5, 339.5, 488.1, 488.2, 698.5, 964.5, 1065.5, 1069.5, 1103.5, 1273.5, 1258.1, 1258.2, 1258.3
Nitrocellulose (Blasting Soluble) (¹⁰) 1265. B = (1) C_3H_6O Acetone (2) $C_3H_6O_2$ Ethyl formate (3) $C_3H_6O_2$ Methyl acetate (4) $C_4H_8O_2$ Ethyl acetate (5) $C_5H_{10}O_2$ Propyl acetate (6) $C_6H_{12}O_2$ Ethyl butyrate (7) $C_7H_{14}O_2$ Amyl acetate (8) $C_{11}H_{15}NO$ Acetoethyl- <i>o</i> -toluide (9) $C_{12}H_{14}O_4$ Ethyl phthalate (10) $C_{12}H_{17}NO_2$ Ethyl <i>o</i> -toluylethylcarbamate B = C = CH_4O $C_4H_{10}O$ Methyl alcohol Ethyl ether CH_4O C_7H_8O Methyl alcohol Anisole C_2H_6O $C_4H_{10}O$ Ethyl alcohol Ethyl ether $C_4H_{10}O$ C_7H_8O Ethyl ether Benzyl alcohol

Nitrocellulose (gun- cotton) (¹⁰) B = C_3H_6O Acetone
Nitrocellulose (highly soluble) (¹⁰) B = C_3H_6O Acetone $C_4H_8O_2$ Ethyl acetate
Three-Component Systems CCl₄ Carbon tetrachloride 1266. B = $C_2H_4Br_2$ Ethylene bromide C = C_7H_8 Toluene ($\pm 0.025\%$) (²⁸⁵) Wt. % A/Wt. % C | $1/d_4^{25}$ 0 Wt. % B 0/100 | 1.1593 10/90 | 1.1043 20/80 | 1.0530 30/70 | 1.0000 40/60 | 0.9463 50/50 | 0.8932 60/40 | 0.8420 70/30 | 0.7873 80/20 | 0.7349 90/10 | 0.6820 100/0 | 0.6300 10 Wt. % B 0/100 | 1.0890 10/90 | 1.0405 20/80 | 0.9940 30/70 | 0.9463 40/60 | 0.8977 50/50 | 0.8502 60/40 | 0.8035 70/30 | 0.7550 80/20 | 0.7072 90/10 | 0.6599 100/0 | 0.6130 20 Wt. % B 0/100 | 1.0190 10/90 | 0.9765 20/80 | 0.9348 30/70 | 0.8922 40/60 | 0.8496 50/50 | 0.8067 60/40 | 0.7654 70/30 | 0.7222 80/20 | 0.6800 90/10 | 0.6378 100/0 | 0.5958 30 Wt. % B 0/100 | 0.9489 10/90 | 0.9124 20/80 | 0.8755

Wt. % A/Wt. % C | $1/d_4^{25}$ 30 Wt. % B.—(Continued) 30/70 | 0.8382 40/60 | 0.8012 50/50 | 0.7638 60/40 | 0.7278 70/30 | 0.6897 80/20 | 0.6527 90/10 | 0.6155 100/0 | 0.5789 40 Wt. % B 0/100 | 0.8790 10/90 | 0.8484 20/80 | 0.8164 30/70 | 0.7847 40/60 | 0.7529 50/50 | 0.7205 60/40 | 0.6893 70/30 | 0.6572 80/20 | 0.6249 90/10 | 0.5933 100/0 | 0.5620 50 Wt. % B 0/100 | 0.8092 10/90 | 0.7844 20/80 | 0.7572 30/70 | 0.7309 40/60 | 0.7043 50/50 | 0.6772 60/40 | 0.6510 70/30 | 0.6246 80/20 | 0.5971 90/10 | 0.5711 100/0 | 0.5450 60 Wt. % B 0/100 | 0.7395 10/90 | 0.7194 20/80 | 0.6979 30/70 | 0.6770 40/60 | 0.6558 50/50 | 0.6337 60/40 | 0.6125 70/30 | 0.5918 80/20 | 0.5696 90/10 | 0.5489 100/0 | 0.5280 70 Wt. % B 0/100 | 0.6701 10/90 | 0.6545 20/80 | 0.6381 30/70 | 0.6222 40/60 | 0.6065 50/50 | 0.5903 60/40 | 0.5740 70/30 | 0.5585 80/20 | 0.5421 90/10 | 0.5262 100/0 | 0.5109 80 Wt. % B 0/100 | 0.6002 10/90 | 0.5896 20/80 | 0.5788 30/70 | 0.5680 40/60 | 0.5575

Wt. % A/Wt. % C	$1/d_4^{25}$
50/50	0.5470
60/40	0.5360
70/30	0.5257
80/20	0.5146
90/10	0.5040
100/0	0.4939
90 Wt. % B	
0/100	0.5305
10/90	0.5244
20/80	0.5190
30/70	0.5139
40/60	0.5086
50/50	0.5031
60/40	0.4980
70/30	0.4923
80/20	0.4870
90/10	0.4816
100/0	0.4768
100 Wt. % B	
0/0	0.4596

CHBr₃

Bromoform
1267. B = CHI₃
Iodoform
C = C₆H₆ (254)

1268. B = CHI₃
Iodoform
C = C₈H₁₀
Xylene (254)

CHI₃

Iodoform
1269. B = CH₂I₂
Methylene iodide
C = C₆H₆ (260)

1270. B = CH₂I₂
Methylene iodide
C = C₈H₁₀
Xylene (260)

CH₃I

Methyl iodide
1271. B = C₂H₅I
Ethyl iodide
C = C₆H₆ (254)

1272. B = C₂H₅I
Ethyl iodide
C = C₈H₁₀
Xylene (254)

CH₃NO

Formamide
1272.5. B = C₂H₆O
Ethyl alcohol
C = C₈H₁₀IN
Tetraethylammonium iodide
(360)

C₂H₄Br₂
Ethylene bromide
1273. B = C₆H₅NO₂
Nitrobenzene
C = C₈H₁₄O₆
Ethyl tartrate (220)¹

C₂H₄O₂
Acetic acid
1273.5. B = C₂H₆O
Ethyl alcohol
C = Turpentine (263)¹

1274. B = C₃H₈O₃
Glycerol
C = C₄H₁₀O
Ethyl ether (44)¹

C₂H₆O

Ethyl alcohol
1275. B = C₃H₆O
Acetone
C = C₁₃H₁₀O
Benzophenone (33)¹

1276. B = C₆H₃N₃O₇
Picric acid
C = C₁₄H₁₀
Phenanthrene (18)¹

1277. B = C₆H₃N₃O₇
Picric acid
C = C₂₀H₁₃N₃O₇
Phenanthrene picrate (18)¹

C₃H₆O

Acetone
1277.5. B = C₄H₁₀O
Ethyl ether
C = C₆H₆ (355)¹

1278. B = C₆H₆
C = C₁₃H₁₀O
Benzophenone (33)¹

C₄H₈O₂

Ethyl acetate
1279. B = C₆H₆
C = C₁₀H₁₆O
Camphor (263)¹

C₆H₄N₂O₄

m-Dinitrobenzene
1280. B = C₇H₈
Toluene
C = C₁₀H₈
Naphthalene (319)¹

C₆H₆

1281. B = C₇H₅N₃O₆
Trinitrotoluene
C = C₁₀H₈
Naphthalene (319)¹

C₆H₆O

Phenol
1282. B = C₇H₈O, *o*-Cresol
C = C₇H₈O, *m*-Cresol
(±0.25 %)(86)

Wt. %			
A	B	C	$d_4^{15.5}$
0	79.9	20.1	1.0403
5	75.9	19.1	1.0421
10	71.9	18.1	1.0439
15	67.9	17.1	1.0457
20	63.9	16.1	1.0476
25	59.9	15.1	1.0494
30	55.9	14.1	1.0511
35	51.9	13.1	1.0530
40	47.9	12.1	1.0549

1283. B = C₇H₈O, *m*-Cresol
C = C₇H₈O, *p*-Cresol
(±0.25 %)(86)

Wt. %			
A	B	C	$d_4^{15.5}$
0	49.3	50.7	1.0384
5	46.8	48.2	1.0403
10	44.4	45.6	1.0422
15	41.9	43.1	1.0441
20	39.4	40.6	1.0460
25	37.0	38.0	1.0479
30	34.5	35.5	1.0497
35	32.1	32.9	1.0517
40	29.6	30.4	1.0537
45	27.1	27.9	1.0556
50	24.6	25.4	1.0576

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Elementary substances. P, S, Se, Te and the halogens. H ₂ , N ₂ , O ₂ , O ₃ and the zero- group elements. Hg.	Substances élémentaires. P, S, Se, Te, et les halogènes. H ₂ , N ₂ , O ₂ , O ₃ et les gaz nobles. Hg.	Elementare Stoffe. P, S, Se, Te und Halogene. H ₂ , N ₂ , O ₂ , O ₃ und Edelgase. Hg.	Elementi. P, S, Se, Te ed alogeni . . 202 H ₂ , N ₂ , O ₂ , O ₃ e gas nobili 203 Hg 206
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VAPOR PRESSURES OF P, S, SE, TE AND THE HALOGENS

ALAN W. C. MENZIES

THE CRYSTALLINE STATE

$$\log_{10} p = \frac{0.05223A}{T} + B; p \text{ in mm } \left(= \frac{1}{760} A_n \right); t \text{ in } ^\circ\text{C}, T = t + 273.1$$

Br, BROMINE (16, 18, 31)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 5\%$		$\pm 5\%$
(-95)	(0.0022)	-45	1.83
-90	0.0052		$\pm 3\%$
-85	0.0117	-40	2.98
-80	0.0251	-35	4.77
-75	0.0513	-30	7.45
-70	0.102	-25	11.4
-65	0.192	-20	17.1
-60	0.357	-15	25.2
-55	0.628	-10	36.6
-50	1.09	-7.3*	44.4

* M. P.

Cl, CHLORINE (16)

A = -29 293; B = 9.950; accuracy, $\pm 10\%$; range, -154 to -103°C

I, IODINE (1, 2, 14, 31)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 5\%$		$\pm 1\%$
-50	0.0437	40	1.03
-40	0.0819	50	2.16
-30	0.0880	60	4.31
-20	0.0030	70	8.22
-10	0.0099	80	15.1
	$\pm 1\%$	90	26.8
0	0.0299	100	45.5
+10	0.0808	110	74.9
20	0.202	114.15*	90.1
30	0.471		

* M. P.

P, PHOSPHORUS (7, 24, 36)

For white P: A = -63 123; B = 9.6511; range, 20 to 44.1°C (M. P.); error $\pm < 10\%$.

For violet P: A = -108 510; B = 11.0842; range, 380 to ca. 590°C ; accuracy $\pm 5\%$ above 500°C .

S, SULFUR (13, 34)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
50	0.0002	90	0.0049
60	0.0004	100	0.010
70	0.0010	110	0.021
80	0.0023	114.5*	0.028†

* M. P.

† $\pm 10\%$.

Se, SELENIUM (10)

Hexagonal form

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 10\%$		$\pm 10\%$
195	0.0010	210	0.0032
200	0.0015	215	0.0047
205	0.0022	217.4*	0.0055

* M. P.

THE LIQUID STATE UP TO ONE ATMOSPHERE

Br, BROMINE (4, 18, 28, 31)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 2\%$		$\pm 2\%$
-7.3*	44.4	30	264
-5	50.5	35	324
0	65.9	40	392
+5	85.3	45	472
10	109	50	564
15	138	55	670
20	173	58.78†	760
25	214	(60)	(793)
		302†	

* M. P.

† $\pm 0.03^\circ$.

‡ Crit.

Cl, CHLORINE (16, 19, 21, 29, 38)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 5\%$		$\pm 3\%$
-103*	8.9	-50	363
-100	11.8	-40	594
-90	27.8		$\pm 1\%$
-80	58.7	-34.6	760
	$\pm 3\%$		$\pm 2\%$
-70	115	-30	935
-60	211	-20	1398

* M. P.

I, IODINE (31, 32, 37)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 2\%$		$\pm 2\%$
114.15	90.1	160	394
115	92.9	170	521
120	111	180	679
130	157	184.35*	760
140	217	190	(869)
150	294	553.4†	

* $\pm 0.1^\circ$.† $\pm 3^\circ\text{crit.}$

P, PHOSPHORUS (20, 24, 25, 30, 36)

$\log_{10} p, \text{ mm} = 11.5694 - \frac{2898.1}{T} - 1.2566 \log_{10} T$; range, 44.1 to 635°C ; accuracy of $p = \pm 7\%$ except near the B. P., 279.7°C , where it is $\pm 2\%$ (equivalent to $\pm 1^\circ$).

S, SULFUR (3, 5, 6, 8, 9, 12, 13, 15, 17, 26, 27, 32, 33, 34, 39)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 10\%$	250	12
114.5 M. P.	0.028	260	16
120	0.040	270	21
130	0.074	280	28
140	0.13	290	37
150	0.22	300	48
160	0.37	310	60
	$\pm 7\%$	320	76
170	0.59	330	95
180	0.91		$\pm 5\%$
190	1.4	340	118
200	2.1	350	146
210	3.1	360	179
220	4.4	370	218
230	6.3	380	263
240	8.7		

S.—(Continued)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 3\%$		$\pm < 0.1\%$
390	325	444.60	760.0
400	376		$\pm 0.3\%$
410	446	450	821
	$\pm 1\%$		$\pm 3\%$
420	525	460	948
430	613	470	1093
	$\pm 0.3\%$	480	1257
440	711		$\pm 5\%$
		490	1441

$t = 444.60 + 0.0910(p - 760) - 0.049(p - 760)^2$, for $p = 695$ to 805 mm (± 1 –2 mm). Relative accuracy, ± 0.1 –0.2 mm (40).
SE, SELENIUM (10, 23, 30)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm 10\%$		$\pm 10\%$
217.4 M. P.	0.0055	480	28
220	0.0062	500	42
225	0.0078		$\pm 3\%$
230	0.0097	620	313
235	0.0120	640	420
390	3.0	660	550
400	4.0	680	700
420	7.0	688	760
440	11	700	865
460	17	710	970

TE, TELLURIUM (11, 35)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
488	0.464	671	14.1
578	3.34	1390	760

VAPOR PRESSURES AND ORTHOBARIC DENSITIES ABOVE ONE ATMOSPHERE

d_l (resp. d_v) = density of saturated liquid (resp. vapor) in g per cm^3 ; $d_m = \frac{1}{2}(d_l + d_v)$.

All values at the critical point are given in bold-face type.

The latent heat of vaporization (l) in joules per g is given by the equation:

$$l = 0.10133 \left(\frac{1}{d_v} - \frac{1}{d_l} \right) T \cdot \frac{dp}{dT} = \frac{0.10133}{0.4343} \left(\frac{1}{d_v} - \frac{1}{d_l} \right) p T \frac{d \log_{10} p}{dT}$$

CL, CHLORINE (16, 19, 21, 22, 29, 38)

$t, ^\circ\text{C}$	$p, \text{ atm.}$	d_l	d_v
	$\pm 1\%$		$\pm 0.5\%$
-34.6	1.00	1.561	
	$\pm 2\%$		
-30	1.23	1.550	
-20	1.84	1.524	
-10	2.61	1.496	
0	3.65	1.468	0.0128
+10	4.96	1.438	0.0175
20	6.57	1.408	0.0226
30	8.60	1.377	0.0300

VAPOR PRESSURES OF THE ATMOSPHERIC GASES

C. A. CROMMELIN

I. VAPOR PRESSURES UP TO TWO ATMOSPHERES

p , in mm Hg ($=1/760 A_n$); t , in $^\circ\text{C}$ (Leiden scale, *v. Vol. I*, p. 54); the following equation applies over the range covered by the tabulated data, except as otherwise indicated:

$$\log_{10} p_{\text{mm}} = \frac{0.05223A}{T} + B + CT + DT^2 + ET^3$$

Trp. = triple point.

CL.—(Continued)

$t, ^\circ\text{C}$	$p, \text{ atm.}$	d_l	d_v
	$\pm ?\%$		
40	11.1	1.344	0.0384
50	14.1	1.310	0.0486
60	17.6	1.375	0.0600
70	21.6	1.240	0.0740
80	26.2	1.199	0.0910
90	31.5	1.156	0.1125
100	37.6	1.109	0.136
110	44.4	1.059	0.164
120	52.4	0.998	0.206
130	61.4	0.920	0.258
140	71.4	0.750	0.405
144 ± 1	(76.1)		0.573

$$d_m = 0.7403 - 0.0011618t.$$

P, PHOSPHORUS (20, 24, 25, 30, 36)

For white and violet P: $\log_{10} p, \text{ mm} = 11.5694 - 2898.1/T - 1.2566 \log_{10} T$; ($p \pm 7\%$) range, 44.1 to 635 $^\circ\text{C}$ ($\pm 2\%$ near B. P., 279.7 $^\circ\text{C}$); t , crit. = 720.6 $\pm 3^\circ\text{C}$; p , crit. = 100 ± 10 atm. (calc. from equation).

S, SULFUR (5, 6, 8, 9, 12, 13, 15, 17, 26, 27, 32, 33, 34, 39)

$t, ^\circ\text{C}$	$p, \text{ mm}$	$t, ^\circ\text{C}$	$p, \text{ mm}$
	$\pm < 0.1\%$		$\pm 5\%$
444.6	760	500	1647
	$\pm 0.3\%$	510	1876
450	821	520	2130
	$\pm 3\%$	530	2410
460	948	540	2718
470	1093	550	3055
480	1257	560	3423
	$\pm 5\%$	570	3824
490	1441	1040 $\pm 5^\circ$	

LITERATURE

(For key to the periodicals see end of volume)

- (1) Baxter and Grose, *1*, **37**: 1061; 15. (2) Baxter, Hickey and Holmes, *1*, **29**: 127; 07. (3) Bodenstein, *7*, **30**: 113; 99. (4) Bouzat and Leluan, *34*, **178**: 635; 24. (5) Callendar and Griffiths, *62*, **182A**: 119; 91. (6) Callendar and Moss, *5*, **84**: 595; 10. (7) Centnerszwer, *7*, **85**: 99; 13. (8) Chappuis, *238*, **16**; 14. (9) Day and Sosman, *12*, **38**: 517; 12.
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(20) Jolibois, *34*, **149**: 287; 09. (21) Knietsch, *13*, **259**: 100; 90. (22) Lange, *92*, **1900**: 683. (23) LeChatelier, *34*, **121**: 323; 95. (24) MacRae and Van Voorhis, *1*, **43**: 547; 21. (25) Marckwald and Helmholtz, *93*, **124**: 81; 22. (26) Matthies, *63*, **7**: 395; 06. (27) Mueller and Burgess, *31*, No. **339**; 19. (28) Nadeždin, *Kiev Univ. Unters.*, **6**: 32; 85. **9**: 721; 85. (29) Pellaton, *42*, **13**: 426; 15.
(30) Preuner and Brockmoeller, *7*, **81**: 129; 12. (31) Ramsay and Young, *4*, **49**: 453; 86. (32) Rassow, *93*, **114**: 117; 20. (33) Regnault, *151*, **26**: 339; 62. (34) Ruff and Graf, *93*, **58**: 209; 08. (35) Saint-Claire Deville and Troost, *34*, **91**: 83; 80. (36) Smits and Bokhorst, *7*, **91**: 249; 16. (37) Stelzner and Niederschulte, *96*, **7**: 159; 05. (38) Trautz and Gerwig, *93*, **134**: 417; 24. (39) Waidner and Burgess, *31A*, No. **6**: 149; 10.

1. Two-Phase, Crystal—Vapor, Sublimation Pressures

Argon	{	t°	-189.19 Trp.	-207.62	A = -7 814.5	(1)	
		p	512.17	21.97	B = +7.5741		
Kr	{	t°	-169 Trp.	-188.7	A = -10 065	(31)	
		p	132.5	9.0	B = +7.1770		
N ₂	{	t°	-209.86 Trp.	-215.20	A = -6 881.3	(2); cf. (10, 35)	
		p	96.4	28.82	B = +7.66558		
Neon (39)							
		$t, ^{\circ}\text{C}$	p_{mm}				
		-248.56	317			-253.64	20.0
		-248.84	279			-254.07	14.9
		-249.09	250			-254.63	9.8
		-249.62	195			-254.92	7.8
		-250.22	148			-255.43	5.1
		-250.84	111			-255.79	3.7
		-251.24	91			-256.46	2.1
		-252.62	40			-256.79	1.3
		-253.16	28.2			-257.62	0.55
		-253.30	25.3				
Rn	{	t°	-70.5 Trp.	-78	-101	-127	
		p	500	250*	50*	9*	
		Lit.	(9)		(34)		

* These pressures probably too high, possibly on account of impurities.

2. Two-Phase, Liquid—Vapor

Argon (1)		A = -9377.0	N ₂ (2)	$t, ^\circ\text{C}$	p_{mm}
		B = 6.92387			
$t, ^\circ\text{C}$	p_{mm}				
-182.82	1026.0		-188.88	1591.1	
-185.66	(760)		-193.91	938.6	
-189.19	512.17 Trp.		-195.78	760.0	
	A = -6826.0		-198.26	561.3	
	B = 6.9605		-204.69	228.37	
	H ₂ (3, 11, 28)		-208.58	120.90	
-248.50	2199.2		-209.86	96.4 Trp.	
-252.45	823.7			A = -6407.0	
-252.74	760.0			B = 7.5777	
-254.73	397.6			C = -0.00476	
-256.61	191.9			Neon (4, 24, 39)	
-258.46	79.9		-228.66	19 797	
-259.14	51.4 Trp.		-229.26	18 472	
	A = -849.48		-231.71	13 245	
	B = 4.5331		-233.60	10 042	
	C = 0.03240		-236.82	6 057.2	
	D = -0.04189		-240.25	3 171.5	
	E = 0.0484		-241.77	2 264.8	
	Helium (18, 19, 29)		-243.69	1 434.9	
$t, ^\circ\text{C}$	p_{mm}		-245.68	816.2	
-268.88	760		-245.79	791.0	
-269.20	565		-245.88	767.1	
-269.57	359.5		-246.66	605.2	
-269.92	197		-247.33	486.0	
-270.85	51		-247.49	451.6	
-271.61	4.15		-247.82	410	
-271.74	3		-248.10	373	
	$\log_{10} p = 4.7290 - 7.9780/T$		-248.29	350	
	$- 0.13628/T^2 + 4.3634/T^3$		-248.51	325.0	
	Range, 5.19 to 1.475°K			A = -1615.5	
	Kr (31)			B = 5.69991	
-149.9	898.20			C = 0.0111800	
-152.1	760.0				
-160.3	386.4				
-169 Trp.	(132.5)				

O₂ (2, 10, 21, 22, 35)

$t, ^\circ\text{C}$	p_{mm}
-182.62	786.63
-182.95	760.00
-186.91	493.30
-192.01	263.19
-195.50	162.15
-201.38	64.01
-204.52	36.11
-210.72	9.59
-218.4	±2 Trp.
	A = -8028.1
	B = 8.1173
	C = -0.00648
	Range, -182 to -211°K
Rn Radon (9)	
-38.6	2000
-61.8	(760)
-70.5 Trp.	500

A = -17 153

B = 7.12128

O₃ Ozone* (14, 32, 33)

$t, ^\circ\text{C} \pm 1$	p_{mm}
-193.1	0.015
-183.1	0.17
-173.1	1.3
-163.1	6.87
-153.1	25.4
-143.1	74.6
-133.1	182.8
-123.1	387.7
-112.4	760
-5	17 atm. (critical)
-182	1.78 g/cm ³ (d_l)

* Evaluated by C. S. Cragoe, cooperating expert.

Xenon (31)

Trp. = ca. -140°K

II. VAPOR PRESSURES AND ORTHOBARIC DENSITIES ABOVE ONE ATMOSPHERE

 p = vapor pressure in normal atmospheres. t = temperature, °C, Leiden scale (*v. Vol. I, p. 54*). $T = t + 273.1^\circ$. d_l (resp. d_v) = density of saturated liquid (resp. vapor) in grams per cm³.

$d_m = \frac{1}{2}(d_l + d_v)$.

All values at the critical point are given in bold-face type.

Argon (1, 5, 6, 16)

$t, ^\circ\text{C}$	$p, \text{atm.}$
-122.44	47.996
-125.49	42.457
-129.83	35.846
-134.72	29.264
-140.80	22.185
-150.57	13.707
-161.23	7.4332
-185.66	1.0000

$$\log_{10} p = 4.85033 - 634.391/T + 30\,769.09/T^2 - 1\,076\,464/T^3; \text{ for } p > 1.$$

$t, ^\circ\text{C}$	d_l	d_v
-122.44	0.53078	
-125.17	0.77289	0.29534
-135.51	0.97385	0.15994
-150.76	1.13851	0.06785
-161.23	1.22414	0.03723*
-175.39	1.32482	0.01457*
-183.15	1.37396	0.00801*

$d_m = 0.20956 - 0.0026235t$.

* Calculated from equation of state.

H₂ (3, 11, 12, 23, 26)

$t, ^\circ\text{C}$	$p, \text{atm.}$
-239.91	12.80
-240.49	11.752
-245.68	5.0566
-248.50	2.8937
-252.74	1.0000

$$T \log_{10} p = -56.605 + 3.8015T - 0.10458T^2 + 0.003321T^3 - 0.043219T^4; \text{ for } p > 1.$$

$t, ^\circ\text{C}$	d_l	d_v
-239.91	0.03102	
-240.57	0.04316	0.01922
-243.03	0.05402	0.01081
-245.73	0.06050	0.00613
-249.89	0.06724	0.00264
-253.24	0.07134	0.00116*
-256.75	0.07494	0.00038*
-258.27	0.07631	0.00020*

$d_m = -0.063510 -$

$0.00039402t$.

* Calculated from equation of state.

Helium (19, 20, 29, 36)

$T, ^\circ\text{K}$	$p, \text{atm.}$
5.19	2.261
5.16	2.195
4.90	1.749
4.21	1.000

$$\log_{10} p = 1.8482 - 7.9780/T - 0.13628/T^2 + 4.3634/T^3$$

(from critical point to $T = 1.475^\circ$).

$T, ^\circ\text{K}$	d_l	d_v
5.19	0.06930	
4.71	0.1139	0.02699
4.59	0.1165	0.02389
4.23	0.1253	0.01637

Helium.—(Continued)

$T, ^\circ\text{K}$	d_l	d_v
4.22	0.1255	0.01618*
3.90	0.1311	0.01176*
3.30	0.1395	0.006435*
2.56	0.1457	0.002079*
2.37	0.1466	0.001368*
2.30	0.1469†	0.001159*
2.21	0.1466	
2.10	0.1464	
1.92	0.1462	
1.59	0.1460	
1.20	0.1459	

$$d_m = -0.40263 - 0.0017616t.$$

* Calculated from equation of state.

† Maximum.

Kr (31)

$t, ^\circ\text{C}$	$p, \text{atm.}$
-62.6	54.24
-70	41.12
-90	24.27
-110	11.32
-130	4.315
-150	1.175
-151.8	1.000

$$d_l \text{ at } -146^\circ = 2.155.$$

N₂ (2, 7, 17, 27)

$t, ^\circ\text{C}$	$p, \text{atm.}$
-147.13	33.490
-152.11	25.889
-161.31	15.949
-173.58	7.3705
-182.47	3.7248
-195.78	1.0000

$$\log_{10} p = 5.76381 - 853.522/T + 54.3723/T^2 - 1.783500/T^3; \text{ for } p > 1.$$

A new series of determinations and discussion of all available data are given in (38).

$t, ^\circ\text{C}$	d_l	d_v
-147.13	0.31096	
-148.08	0.4314	0.2000
-153.65	0.5332	0.1177
-161.20	0.6071	0.06987
-173.73	0.6922	0.02962

N₂.—(Continued)

$t, ^\circ\text{C}$	d_l	d_v
-182.51	0.7433	0.01576*
-195.09	0.8043	0.00498*
-208.36	0.8622	0.000868*

$$d_m = 0.022904 - 0.0019577t.$$

* Calculated from equation of state.

Neon (4, 8, 13, 24, 25)

$t, ^\circ\text{C}$	$p, \text{atm.}$
-228.71	26.86
-231.71	17.428
-236.82	7.970
-241.77	2.980
-245.92	1.000

$$T \log_{10} p = -84.380 + 2.81910T + 0.0111800T^2.$$

$t, ^\circ\text{C}$	d_l	d_v
-228.71	0.4835	
-230.07	0.74866	0.23935
-234.01	0.92803	0.11592
-237.04	1.01750	0.06742
-242.96	1.14960	0.02013
-247.92	1.23824	0.00534*

$$d_m = -1.154406 - 0.00716146t.$$

* Calculated from equation of state.

O₂ (2, 15, 27)

$t, ^\circ\text{C}$	$p, \text{atm.}$
-118.82	49.713
-118.88	49.640
-125.28	38.571
-135.96	24.528
-149.25	12.506
-154.87	9.096
-182.95	1.000

A new series of determinations and discussion of all available data are given in (38).

$t, ^\circ\text{C}$	d_l	d_v
-118.82	0.4299	
-120.4	0.6032	0.2701
-123.3	0.6779	0.2022
-129.9	0.7781	0.1320
-140.2	0.8742	0.0805
-154.5	0.9758	0.0385

O₂.—(Continued)

$t, ^\circ\text{C}$	d_l	d_v
-182.0	1.1415	0.00490*
-210.4	1.2746	0.0000865*

$$d_m = 0.1608 - 0.002265t.$$

* Calculated from equation of state.

Rn, Radon (9)

$t, ^\circ\text{C}$	$p, \text{atm.}$
+104.4	62.44
100	59.43
70	37.67
40	13.64
+10	11.40
-20	5.260
-50	2.065
-60	1.361
-61.8	1.000

Xenon (30, 31)

$t, ^\circ\text{C}$	$p, \text{atm.}$
+16.6	58.22
0.0	41.24
-20	26.73

Xenon.—(Continued)

$t, ^\circ\text{C}$	$p, \text{atm.}$
-40	15.85
-60	8.570
-80	4.064
-100	1.629
-109.1	1.000

$t, ^\circ\text{C}$	d_l	d_v
+16.6	1.154	
16	1.468	0.844
15	1.528	0.791
+10	1.745	0.602
0	1.987	0.421
-10	2.169	0.313
-20	2.292	0.238
-30	2.410	0.180
-40	2.511	0.137
-50	2.605	0.108
-60	2.699	0.079
-70	2.792	0.048

$$d_m = 1.205 - 0.003055t.$$

LITERATURE

(For a key to the periodicals see end of volume)

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VAPOR PRESSURES OF THE METALS

J. JOHNSTON, F. FENWICK AND H. G. LEOPOLD

The value, for the several metals, of the coefficient A (in kilojoules) and of B (for pressures p in mm of mercury) in the equation $\log_{10} p = -52.23 A/T + B$, together with the values (calculated from the equation) of the temperatures corresponding to the pressures 760, 1, and 0.001 mm Hg. (l) = liquid, (s) = solid.

Substance	State	Range covered by equation, °C	A (kilo- joule)	B (for p in mm Hg)	°C at which p in mm Hg equals			Lit.
					760	1	0.001	
Ag	(l)	1650–1950	250	8.762	1948	(1218)	(837)*	(22, 23, 24, 25, 54, 63, 73, 85, 88, 90)
Al	(l)				1800			(22, 25, 88)
As	(l)	800– 860	47.1	6.692	Calculated triple point 36.0 atm., 820°C			(34)
	(s)	440– 815	133	10.800	604.3	(370.2)	(230.3)	(20, 21, 29, 30, 34, 38, 40, 47, 66, 68, 73, 81)
Au	(l)	2315–2500	385	9.853	(2611)	(1768)	(1292)	(54, 73, 85, 88)
Ba	(l)	930–1130	350	15.765	(1146)	(887)	(701.1)*	(77)
Bi	(l)	1210–1420	200	8.876	(1470)	(904)	(606.8)	(22, 23, 24, 25, 54, 73, 81)
C	(l)	3880–4430	540	9.596	(3927)	(2666)*	(2018)*	(1, 14, 15, 45, 46, 55, 56, 57, 69, 84, 92)
Ca†	(l)	960–1110	370	16.240	(1174)	(917)	(731)*	(77, 79)
	(s)	500– 700	195	9.697	(1221)‡	(777)	529	(64)
Cd	(l)	500– 840	99.9	7.897	767			(4, 5, 18, 32, 36, 54, 59, 73)
	(l)	320.9– 525	111–0.017§	12.107	$p = 10$ °C = 485.3	5 454.6	1 392.2	
	(s)	150– 320.9	109.0	8.564		(391.7)‡	219.1	(9, 10, 13, 59)
Co||	(l)	2375	309	7.571	(3168)	(1859)	(1254)*	(80)
Cr	(l)	2200			2200			(22, 25)
Cs	(l)	200– 350	73.4	6.949	(669.3)	278.6	(112.3)	(2, 12, 28, 45, 48, 52, 78, 82)
Cu	(l)	2100–2310	468	12.344	2310	(1707)	(1320)	(16, 22, 23, 24, 25, 54, 58, 73, 81, 85)
Fe	(l)	2220–2450	309	7.482	(3235)	(1884)	(1267)*	(22, 25, 76)
Hg	(l)	400–1300	58.7	7.752	$p = 10^4$ °C = 544.1	10^5 841	5×10^6 1220	(3, 6, 7, 9, 10, 12, 19, 26, 31, 32, 33, 36, 37, 41, 43, 44, 49, 60, 61, 62, 65, 67, 73, 82, 83, 86, 87, 94)
	(l)	–38.87–400			356.70	See special table, p. 206		
	(s)	(–80)–(–38.87)	73.0	10.383	$p = 10^{-9}$ °C = –76.4	10^{-8} –65.7	10^{-7} –53.6	10^{-6} –40.4
K	(l)	260– 760	84.9	7.183	758	344.2	(162.3)	(17, 28, 32, 42, 48, 78, 82)
Mg	(l)	900–1070	260	12.993	1070	(772)	(576.0)*	(8, 22, 25, 77, 88)
Mn	(l)	1510–1900	267	9.300	1900	(1227)*	(861)*	(22, 25, 74)
Mo	(s)	1800–2240	680	10.844	(4188)‡	(3003)‡	(2293)	(39, 53, 54, 93)
Na	(l)	180– 883	103.3	7.553	882	441.2	238.1	(19, 27, 28, 32, 37, 50, 70, 78, 91)
Ni||	(l)	2360	309	7.600	(3147)	(1851)	(1250)*	(75)
Pb	(l)	525–1325	188.5	7.827	(1718)	985	636.2	(11, 12, 22, 23, 24, 25, 35, 54, 71, 72, 73, 88, 90)
Pt	(s)	1425–1765	486	7.786	(4901)‡	(2987)‡	(2080)‡	(39, 53, 54)
Rb	(l)	250– 370	76	6.976	(696.0)	295.8	(124.8)	(12, 28, 42, 78, 82)
Sb	(l)	1070–1325	189	9.051	1327	(818)	(546.0)*	(22, 25, 54, 73, 81)
Si	(s)	1200–1320	170	5.950	(2620)‡	1219	(719.2)	(89); cf. (96)
Sn	(l)	1950–2270	328	9.643	(2260)	(1503)	(1282)	(22, 23, 24, 25, 54, 73, 88)
Sr	(l)	940–1140	360	16.056	(1154)	(899)	(713.4)*	(77)
W	(l)	950–1200	120	6.140	(1650)	(748)	(412.7)	(20, 47, 88, 90)
Tl	(s)	2230–2770	897	9.920	(6383)‡	(4450)‡	(3353)	(39, 51, 54, 95)
Zn	(l)	600– 985	118.0	8.108	906			(4, 5, 12, 23, 24, 32, 36, 54, 59, 71, 73)
	(l)	419.4– 625	127–0.017§	12.184	$p = 20$ °C = (632.3)	10 594.1	5 558.9	1 487.7
	(s)	250– 419.4	133	9.200		(532.0)‡	296.3	(9, 10)

() Extrapolated beyond experimental range.

* Extrapolated below freezing point.

† These two curves are mutually inconsistent.

‡ Extrapolated above melting point.

§ These are the only two cases in which the accuracy of the present data seems to justify the use of a curved line. The equations of these curves are respectively:

$$\log_{10} p_{Cd} = -111 \times 52.23/T - 1.203 \log_{10} T + 12.107$$

and

$$\log_{10} p_{Zn} = -127 \times 52.23/T - 1.203 \log_{10} T + 12.184$$

|| Slope made equal to that of iron.

THE VAPOR PRESSURE OF MERCURY FROM -39 TO $+400^{\circ}\text{C}$ Unit, mm of Hg = $\frac{1}{760} A_n$

$t, ^{\circ}\text{C}$	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°
-30	0.0 ₅ 478	0.0 ₅ 415	0.0 ₅ 359	0.0 ₅ 309	0.0 ₅ 266	0.0 ₅ 229	0.0 ₅ 197	0.0 ₅ 169	0.0 ₅ 145	0.0 ₅ 124
-20	.0 ₄ 181	.0 ₄ 159	.0 ₄ 140	.0 ₄ 123	.0 ₄ 108	.0 ₅ 947	.0 ₅ 828	.0 ₅ 723	.0 ₅ 630	.0 ₅ 549
-10	.0 ₄ 606	.0 ₄ 540	.0 ₄ 481	.0 ₄ 428	.0 ₄ 380	.0 ₄ 337	.0 ₄ 298	.0 ₄ 263	.0 ₄ 232	.0 ₄ 205
-0	.0 ₃ 185	.0 ₃ 166	.0 ₃ 149	.0 ₃ 133	.0 ₃ 119	.0 ₃ 107	.0 ₄ 954	.0 ₄ 853	.0 ₄ 762	.0 ₄ 680
$+0$	.0 ₃ 185	.0 ₃ 206	.0 ₃ 228	.0 ₃ 251	.0 ₃ 276	.0 ₃ 304	.0 ₃ 335	.0 ₃ 369	.0 ₃ 406	0 ₃ 446
$+10$	.0 ₃ 490	.0 ₃ 537	.0 ₃ 588	.0 ₃ 644	.0 ₃ 706	.0 ₃ 773	.0 ₃ 846	.0 ₃ 925	.001009	.001101
20	.001201	.001309	.001426	.001553	.001691	.001840	.002000	.002173	.002359	.002560
30	.002777	.003010	.003261	.003532	.003823	.004135	.004471	.004832	.005219	.005634
40	.006079	.006556	.007067	.007614	.008200	.008827	.009497	.01021	.01098	.01180
50	.01267	.01360	.01459	.01565	.01677	.01797	.01925	.02061	.02206	.02360
60	.02524	.02698	.02883	.03079	.03287	.03507	.03740	.03988	.04251	.04530
70	.04825	.05138	.05469	.05819	.06189	.06580	.06993	.07429	.07889	.08375
80	.08880	.09430	.1000	.1060	.1124	.1191	.1261	.1335	.1413	.1495
90	.1582	.1673	.1769	.1870	.1976	.2086	.2202	.2324	.2453	.2588
100	.2729	.2877	.3032	.3195	.3366	.3544	.3731	.3927	.4132	.4347
110	.4572	.4807	.5052	.5308	.5576	.5857	.6150	.6456	.6776	.7109
120	.7457	.7820	.8198	.8592	.9004	.9434	.9882	1.035	1.084	1.134
130	1.186	1.241	1.298	1.357	1.419	1.484	1.551	1.620	1.692	1.767
140	1.845	1.926	2.010	2.097	2.188	2.282	2.379	2.480	2.585	2.694
150	2.807	2.924	3.046	3.172	3.303	3.438	3.578	3.723	3.873	4.028
160	4.189	4.356	4.528	4.706	4.890	5.080	5.277	5.480	5.689	5.905
170	6.128	6.358	6.596	6.842	7.095	7.356	7.626	7.905	8.193	8.490
180	8.796	9.111	9.436	9.711	10.116	10.472	10.839	11.217	11.607	12.009
190	12.423	12.849	13.287	13.738	14.203	14.681	15.173	15.679	16.200	16.736
200	17.287	17.854	18.437	19.036	19.652	20.285	20.936	21.605	22.292	22.998
210	23.723	24.468	25.233	26.019	26.826	27.654	28.504	29.376	30.271	31.190
220	32.133	33.100	34.092	35.110	36.153	37.222	38.318	39.442	40.595	41.777
230	42.989	44.231	45.503	46.806	48.141	49.509	50.909	52.343	53.812	55.316
240	56.855	58.431	60.044	61.695	63.384	65.113	66.882	68.692	70.543	72.437
250	74.375	76.356	78.381	80.451	82.568	84.732	86.944	89.206	91.518	93.881
260	96.296	98.763	101.28	103.85	106.48	109.17	111.91	114.71	117.57	120.49
270	123.47	126.51	129.62	132.79	136.02	139.34	142.69	146.13	149.64	153.22
280	156.87	160.59	164.39	168.26	172.21	176.24	180.34	184.52	188.79	193.14
290	197.57	202.09	206.70	211.39	216.17	221.04	226.00	231.06	236.21	241.46
300	246.80	252.24	257.78	263.42	269.17	275.02	280.98	287.04	293.21	299.49
310	305.89	312.40	319.02	325.76	332.62	339.60	346.70	353.92	361.26	368.73
320	376.33	384.06	391.92	399.91	408.04	416.31	424.71	433.25	441.94	450.77
330	459.74	468.86	478.13	487.55	497.12	506.85	516.74	526.79	537.00	547.37
340	557.90	568.59	579.45	590.48	601.69	613.08	624.64	636.38	648.30	660.40
350	672.69	685.17	697.83	710.68	723.73	736.98	750.43	764.08	777.92	791.97
360	806.23	820.70	835.38	850.26	865.36	880.68	896.23	912.01	928.02	944.27
370	960.66	977.38	994.34	1011.5	1028.9	1046.5	1064.4	1082.5	1100.9	1119.5
380	1138.4	1157.6	1177.0	1196.6	1216.6	1236.8	1257.3	1278.1	1299.1	1320.3
390	1341.9	1363.9	1386.1	1408.6	1431.3	1454.3	1477.7	1501.3	1525.2	1549.5
400	1574.1	(For continuation use the equation, $\log_{10} p = \frac{-52.23 \times 58.7}{T} + 7.752$, valid up to 1300°C)								

LITERATURE

(For a key to the periodicals see end of volume)

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VAPOR PRESSURE OF CHEMICAL COMPOUNDS IN THE CRYSTALLINE STATE

A. C. EGERTON AND W. EDMONDSON

This section covers the pressure-temperature relations for systems composed of a single crystalline phase in contact with its own vapor. In the case of substances which dissociate on vaporization the value given is the total pressure. The literature references given first are to data to which most weight has been given.

3-TABLE, STANDARD ARRANGEMENT (v. p. viii)

$$\log_{10} p_{\text{mm}} = \frac{-0.05223A}{T} + B$$

Key No.	Formula	Range, °C	A, joule	B	Lit.
2	H ₂ O	v. p. 210			
	HCl*	-158 to -110	19 588	8.4430	(29, 32, 45); cf. (20, 52)
	HBr†	-114 to -86	22 420	8.734	(29, 52, 93); cf. (20)
	HI‡	-97 to -51	24 160	8.259	(29, 52, 93); cf. (92)
8	SO ₂	-95 to -75	35 827	10.5916	(6, 13, 14); cf. (92)
	SO ₃	4 crystalline forms			(50)
	H ₂ S	-110 to -83	20 690	7.880	(52); cf. (93)
	SeO ₂ §	t, °C | p, mm			(38)
		72.0 | 13.43			
		112.5 | 21.28			
		180.9 | 39.00			
		213.5 | 50.12			
		236.9 | 66.07			
		259.9 | 109.6			
		289.2 | 316.2			
		319.9 | 849.0			
		317.0 | 760.0			
	H ₂ Se	-78.11 | 82.5			(12)
		-70.27 | 157.3			
		-70.15 | 158.1			
	H ₂ SeO ₄	25 to 56 | 82 400		14.130	(38)
		t, °C | p, mm			
10	TeH ₂	-60 | 34			(11)
		-50 | 79			
		-45.4 | 102			
	N ₂ O	-144 to -90	23 590	9.579	(13, 14)
	NO	-200 to -161	16 423	10.048	(26, 30); cf. (57, 61)
	N ₂ O ₄||	-100 to -40	55 160	13.400	(23); cf. (76)
		-40 to -10	45 440	11.214	(76); cf. (27, 74)
	N ₂ O ₅	-30 to +30	57 180	12.647	(17, 75)
	NH ₃ ¶	-127 to -78	31 211	9.9974	(15, 45, 53, 88); cf. (7, 13, 14, 57)
	NOCl	p = 55.0 mm at -68.6°			(10)
	NH ₄ Cl**	100 to 400 | 83 486		10.0164	(40, 41, 67, 85, 86, 87); cf. (34, 66)
		t, °C | p, mm			
		338.0 | 760			
		427 | 4 560			
		459 | 8 360			
		490 | 15 200			
		520 | 26 220			
	NH ₄ Br	250 to 400 | 90 208		9.9404	(41, 85)
		760 mm at 394.2°			
	NH ₄ I††	300 to 400 | 95 730		10.2700	(41, 85)
		760 mm at 403.5°			
	NH ₄ HS	6 to 40 | 46 025		10.7500	(35, 109)
		760 mm at 32.7°			

Key No.	Formula	Range, °C	A, joule	B	Lit.
12	PCl ₅	t, °C | p, mm			
		156.1 | 562.3			(85)
		143.6 | 354.8			
		136.7 | 266.1			
		122.2 | 133.4			
		101.4 | 37.58			
	PH ₄ Cl	-78.2 | 10.0			(102)
		-63.0 | 39.81			
		-41.1 | 251.2			
		-26.8 | 760.0			
		-23.1 | 1 000.0			
		+ 0.9 | 5 623.0			
		29.9 | 38 900.0			
	PH ₄ Br	-80 to +40 | 48 115		10.9561	(43)
		760 mm at 38.1°			
	PH ₄ I	10 to 60 | 51 854		10.9500	(43, 85)
		760 mm at 62.5°			
	As ₂ O ₃	100 to 310 | 111 350		12.127	(59, 84); cf. (94)
		355.8° at 760.0 mm			
	SbCl ₃	50.3° at 1.1 mm			(54)
		59.9° at 3.4 mm			
	BiCl ₃	91 to 213 | 13 125		2.681	(54)
		t, °C | p, mm			
16	CO	-220.6 | 4			(24, 33, 60)
		-209.1 | 50			
		-205.70 | 111.33			
		±0.04			
	CO ₂ ‡‡	-135 to -56.7 | 26 179.8		9.9082	(31, 32, 47, 62, 83, 96); cf. (33, 107, 116)
		p = 760.0 at -78.52°			
		log ₁₀ p = - $\frac{1275.62}{T}$ + 0.006833T + 8.3071			
		(-183° to -135°)			
	CCl ₄	-70 to -50 | 34 608		8.05	(57)
		-36.53° at 3.52 mm			
		-27.19° at 6.17 mm			
	(CN) ₂	-72 to -28 | 32 437		9.6539	(63, 103)
	NH ₄ CN	7 to 17 | 41 484		9.978	(36)
	NH ₂ CO ₂ NH ₄	Data conflicting			(9, 37)
	(NH ₄) ₂ CO ₃				(8)
		t, °C | p, mm			
	CNCl	-32.69 | 58.6			(68)
		-30.65 | 60.1			
		-24.7 | 101.71			
		-11.41 | 250.67			
	CNBr	-17 to +35 | 47 051		10.328	(5)

For other C-compounds, see the C-table, p. 208

18	SiCl ₄	1.0 mm at -70°			(100)
		t, °C | p, mm			
	SiH ₃ Cl	-125.3 | 0.5			(99)
		-119.0 | 1.0			
	SiH ₃ Br	-94.0 | 2.5			(98)
	SnCl ₄	-52 to -38 | 46 740		9.824	(57)
		t, °C | p, mm			
	PbCl ₂	400 | 0.00174			(22)
		425 | .0058			
		450 | .0178			
		475 | .051			

Key No.	Formula	Range, °C	A, joule	B	Lit.
23	PbS	<i>t</i> , °C	<i>p</i> , mm		(77)
		850	2.0		
		917	4.0		
		968	10.5		
		995	17.0		
	HgF ₂	Data unreliable			(71)
	Hg ₂ Cl ₂	<i>t</i> , °C	<i>p</i> , mm		(54)
		90	0.004		
		100	0.0089		
		110	0.011		
		120	0.016		
		130	0.0227		
		140	0.038		
		150	0.07		
		160	0.15		
		170	0.27		
		180	0.45		
		60 to 130	85 030	10.888	(42, 95); cf. (3)
		130 to 270	78 850	10.094	
		111 to 235	79 800	10.181	(42, 95); cf. (3)
		100 to 250	82 340	10.057	(42, 95); cf. (3, 19)
		760 mm at 580°			(2)
31	CuO	<i>t</i> , °C	<i>p</i> , mm		(55)
		600	1.34 × 10 ⁻⁷		
		800	1.15 × 10 ⁻⁴		
	CuCl ₂	950	6.8 × 10 ⁻⁴		
		487.6	223.9		(54)
		470.5	128.8		
		407.2	22.39		
		335.2	5.0		
	Ag ₂ O	318.6	3.55		
		1 435	3.4		(110)
		1 316	0.46		
	AuCl ₃ §§	100	7.0		(64)
		138.5	11.0		
		181	61.2		
		202	154.5		
		229	424.2		
	OsO ₄	251	808.7		
		-38 to 40.1	56 500	10.7100	(111)
		700 to 930	135 200	8.33	(54)
	FeCl ₃	<i>t</i> , °C	<i>p</i> , mm		
		245.0	19.95		(54)
		256.0	35.48		
		292.3	316.2		

Key No.	Formula	Range, °C	A, joule	B	Lit.
49	Co ₂ (CO) ₈	15	0.072 mm		(56)
		0 to 69	41 730	9.521	(72)
	NbF ₅	<i>t</i> , °C	<i>p</i> , mm		
		184.5	303.1		(73)
		191.6	329.7		
		194.5	358.9		
	BBr ₃	-50	0.7		(97)
		v. Vol. IV, p. 84			
	B(CH ₃) ₃ NH ₃ §§	0 to 40	53 184	10.172	(101)
		70 to 190	115 000	16.24	(54)
82	NaCl	2.4 mm at 746.9°			(54)

* Over the range -150 to -114°C, Karwat gives the equation:

$$\log p = -\frac{1171.62}{T} - 2.3577 \log T + 14.57497,$$

the coefficient of $\log T$ being obtained from specific heat measurements at low temperatures.

† Henglein gives the equation:

$$\log p = -\frac{2202.0}{T^{1.1602}} + 7.5030,$$

over the range of his measurements from -130 to -95°C.

‡ Henglein gives the equation:

$$\log p = -\frac{1435.9}{T^{1.0496}} + 7.5030$$

§ The results when plotted give an unusual curve.

|| For amount of dissociation see (76).

¶ Karwat gives the equation: $\log p = -\frac{1790.00}{T} - 1.81630 \log T + 14.97593$,

the coefficient of $\log T$ being obtained from specific heat measurements at low temperatures.

** Smith and Calvert give the equation:

$$\log p = -\frac{1920.357}{T} + 9.778609 \log T - 21.21708.$$

†† Smith and Calvert give the equation:

$$\log p = -\frac{7714.591}{T} + 10.04345 \log T + 42.69560.$$

‡‡ Over the range -110 to -80°C Henning, to express his experimental results, gives the equation:

$$\log p = -\frac{1279.11}{T} + 1.75 \log T - 0.0020757T + 5.85242.$$

The simpler equation:

$$\log p = -\frac{1352.6}{T} + 9.8318$$

expresses his experimental results closely.

§§ The vapor is strongly dissociated.

C-TABLE

$$\log_{10} p_{\text{mm}} = \frac{-0.05223A}{T} + B$$

Formula	Name	Range, °C	A	B	Lit.
CH ₄	Methane*	-194 to -184	9 896.2	7.6509	(16, 32, 45); cf. (33, 61)
C ₂ H ₂	Acetylene	-140 to -82	21 914	8.933	(13); cf. (106)
C ₂ H ₂ O ₄	Oxalic acid	55 to 105	90 502.6	12.2229	(112)
C ₂ H ₄ O ₂	Acetic acid	-35 to 10	41 689	8.502	(57, 79, 113, 114); cf. (49)
C ₆ H ₄ BrCl	<i>p</i> -Bromochlorobenzene	23 to 63	69 755	11.629	(91)
C ₆ H ₄ Cl ₂	<i>p</i> -Dichlorobenzene	30 to 50	72 218	12.480	(91); cf. (46, 48)
C ₆ H ₆	Benzene	-58 to -30	42 904	9.556	(25, 57); cf. (4, 68, 114)
		-30 to +5	44 222	9.846	
		0.018 mm at -77.5°			
C ₆ H ₁₂	Cyclohexane	-5 to +5	37 394	8.594	(115)
C ₇ H ₆ O ₂	Benzoic acid	60 to 110	63 820	9.033	(59)
C ₁₀ H ₈	Naphthalene	0 to 80	71 401	11.450	(1, 4, 78, 104); cf. (70, 90)
C ₁₀ H ₁₆ O	Camphor	0 to 180	53 559	8.799	(1, 65, 94, 105); cf. (18, 59)
C ₁₄ H ₈ O ₂	Anthraquinone	224 to 286	110 040	12.305	(58, 94)
C ₁₄ H ₁₀	Anthracene	100 to 160	70 390	8.706	(59)

* Using specific heats at low temperatures, for $\log T$ coefficient, Karwat gives:

$$\log_{10} p_{\text{mm}} = -\frac{554.518}{T} - 1.0831 \log_{10} T + 10.1840$$

VALUES OF p AND t
CH₂O₂, Formic acid (44)

t , °C	p , mm
1	8.8
2	9.7
3	10.6
4	11.6
5	12.8
6	14.1
7	15.5
8	17.4

C ₂ H ₄ Br ₂ , Ethylene bromide*	
(M. P., 9.55°) (69)	
-28.21	1.51
-23.16	1.90
-12.30	2.65
-7.18	3.24
0	3.47
+5.62	5.53
6.54	6.16

* M. P. of pure C₂H₄Br₂, 7.7°.

C ₂ H ₉ NS, NH ₃ (C ₂ H ₅)HS (109)	
5.0	33
13.4	55
17.0	73
23.2	109
31.4	183
35.0	228
37.2	264
40.5	322

C ₃ H ₄ , Allylene (51)	
-110	10

C ₃ H ₄ , Allene (51)	
-146	10

C ₃ H ₆ O, Acetone (21)	
-94.8	0.017

C ₃ H ₆ O ₂ , Methyl acetate (39)	
-135	0.00354

C ₄ H ₁₀ O, Ethyl ether (21)	
-119.8	0.0027
-117.3	0.0065

C ₄ H ₁₂ ClN, Tetramethyl-ammonium chloride (85)	
231.5	690
227.1	567
222.5	430
213.3	312
202.4	187
186.6	108

C ₄ H ₁₂ IN, Tetramethyl-ammonium iodide (85)	
306.2	781
303.0	698
295.8	547
287.4	421
276.6	298
260.6	166
242.6	83

C ₆ H ₃ N ₃ O ₇ , Picric acid (81)	
100.4	0.00249

C₆H₄Br₂, p -Dibromobenzene
(46, 48, 91)

t , °C	p , mm
84.0	7.586
69.4	2.63
52.8	0.6607
32.8	.0794
21.0	.0158

C ₆ H ₄ N ₂ O ₅ , 2, 4-Dinitrophenol (81)	
100	0.228

C ₆ H ₅ N ₂ O ₂ , p -Nitroaniline (82)	
100	0.0136

C ₆ H ₆ O ₂ , Hydroquinol (94)	
155.0	5.9
157.6	7.1
164.3	1.0

C ₇ H ₅ ClO ₂ , Chlorobenzoic acid (80)	
o -	100 0.1803
m -	100.63 .197
p -	100 .045

C ₇ H ₅ NO ₄ , p -Nitrobenzoic acid (80)	
100	0.0096

C ₇ H ₆ O ₃ , Hydroxybenzoic acid (80)	
o -	100 0.397
m -	101.06 .00149
p -	100.91 .00030

C ₈ H ₈ N ₂ O ₃ , Nitroacetanilide (82)	
m -	100 0.0042
p -	100 .0021

C ₈ H ₈ O ₂ , p -Toluic acid (80)	
100	0.216

C ₈ H ₈ O ₃ , Hydroxytoluic acid (80)	
o -3	100 0.235
o -4	100 .121
o -5	100 .182
m -4	100 .0176
p -3	100.17 .00072

C ₁₀ H ₁₈ O, Borneol (105)	
154.3	114.8
129.1	38.9
107.1	12.88
90.5	5.012
79.0	2.455

C ₁₃ H ₁₀ O, Benzophenone (108)	
0	2.03×10 ⁻⁵
8	6.94×10 ⁻⁵
26	6.859×10 ⁻⁴
	7.614×10 ⁻⁴
32	1.418×10 ⁻³
40	3.198×10 ⁻³
	3.933×10 ⁻³

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THE VAPOR PRESSURES OF ICE AND WATER UP TO 100°C

E. W. WASHBURN

In the following tables, the values given are the vapor pressures for the condition that the solid or liquid phase is under its own vapor pressure. If the solid or liquid phase is in contact with the atmosphere, the corresponding vapor pressures will be somewhat higher, and can be obtained by adding to the value given in the table a small increment, Δp , computed by means of the following equations:

Dans les tables suivantes, les valeurs données sont les tensions de vapeur dans la condition de la phase solide ou liquide se trouvant sous la pression de sa propre vapeur. Si la phase liquide ou la phase solide se trouve en contact avec l'atmosphère, les tensions de vapeur correspondantes seront un peu plus élevées, et elles peuvent être obtenues en additionnant aux valeurs données dans les tables un petit accroissement, Δp , calculé au moyen des équations suivantes:

Die in den folgenden Tafeln angegebenen Werte für die Dampfdrucke gelten für den Zustand, dass die feste oder flüssige Phase unter dem eigenen Dampfdruck steht. Ist die feste oder flüssige Phase mit der Atmosphäre in Verbindung, so werden die entsprechenden Dampfdrucke etwas höher sein. Man erhält sie, wenn man zu dem in der Tafel angegebenen Wert das Inkrement Δp addiert, das sich nach den Gleichungen berechnen lässt:

Nelle tabelle seguenti le tensioni riportate sono quelle del solido o del liquido a contatto col solo vapore proprio. Quando il solido o il liquido si trovano in contatto con l'atmosfera, le tensioni di vapore corrispondenti sono un po' più alte e si possono avere aggiungendo al valore della tabella, un incremento Δp , calcolato per mezzo della seguente equazione:

For ice and for water below 0°C:

$$\frac{100\Delta p}{p} = \frac{20}{t + 273}$$

For water above 0°C:

$$100 \frac{\Delta p}{p} = 0.0775 - 3.13 \times 10^{-4}t \text{ (valid up to } t = 40^\circ\text{C)}$$

and

$$100 \frac{\Delta p}{p} = 0.0652 - 8.75 \times 10^{-5}p \text{ (valid above } 50^\circ\text{C)}$$

THE VAPOR PRESSURE OF ICE

Computed from the equation

$$\log_{10} p = \frac{-2445.5646}{T} + 8.2312 \log_{10} T - 0.01677006T + 1.20514 \times 10^{-5}T^2 - 6.757169, \text{ mm Hg}$$

Based upon the measurements of Weber (2) and Scheel and Heuse (1); see Washburn (3).

$$T = 273.1 + t$$

−90° to −30°; unit, 0.001 mm Hg

$t, ^\circ\text{C}$	0	1	2	3	4	5	6	7	8	9
−90	0.070	0.058	0.048	0.040	0.033	0.027	0.022	0.018	0.015	0.012
−80	0.40	0.34	0.29	0.24	0.20	0.17	0.14	0.12	0.10	0.084
−70	1.94	1.67	1.43	1.23	1.05	0.90	0.77	0.66	0.56	0.47
−60	8.08	7.03	6.14	5.34	4.64	4.03	3.49	3.02	2.61	2.25
−50	29.55	26.1	23.0	20.3	17.8	15.7	13.8	12.1	10.6	9.25
−40	96.6	86.2	76.8	68.4	60.9	54.1	48.1	42.6	37.8	33.4
−30	285.9	257.5	231.8	208.4	187.3	168.1	150.7	135.1	120.9	108.1

−30° to 0°; mm Hg

$t, ^\circ\text{C}$	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
−29	0.317	0.314	0.311	0.307	0.304	0.301	0.298	0.295	0.292	0.289
−28	0.351	0.348	0.344	0.341	0.337	0.334	0.330	0.327	0.324	0.320
−27	0.389	0.385	0.381	0.377	0.374	0.370	0.366	0.362	0.359	0.355
−26	0.430	0.426	0.422	0.418	0.414	0.409	0.405	0.401	0.397	0.393
−25	0.476	0.471	0.467	0.462	0.457	0.453	0.448	0.444	0.439	0.435
−24	0.526	0.520	0.515	0.510	0.505	0.500	0.495	0.490	0.486	0.481
−23	0.580	0.574	0.569	0.563	0.558	0.552	0.547	0.541	0.536	0.531
−22	0.640	0.633	0.627	0.621	0.615	0.609	0.603	0.597	0.592	0.586
−21	0.705	0.698	0.691	0.685	0.678	0.672	0.665	0.659	0.652	0.646
−20	0.776	0.769	0.761	0.754	0.747	0.740	0.733	0.726	0.719	0.712
−19	0.854	0.846	0.838	0.830	0.822	0.814	0.806	0.799	0.791	0.783
−18	0.939	0.930	0.921	0.912	0.904	0.895	0.887	0.879	0.870	0.862
−17	1.031	1.021	1.012	1.002	0.993	0.984	0.975	0.966	0.956	0.947
−16	1.132	1.121	1.111	1.101	1.091	1.080	1.070	1.060	1.051	1.041
−15	1.241	1.230	1.219	1.208	1.196	1.186	1.175	1.164	1.153	1.142

-30° to 0°; mm Hg.—(Continued)

<i>t</i> , °C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
-14	1.361	1.348	1.336	1.324	1.312	1.300	1.288	1.276	1.264	1.253
-13	1.490	1.477	1.464	1.450	1.437	1.424	1.411	1.399	1.386	1.373
-12	1.632	1.617	1.602	1.588	1.574	1.559	1.546	1.532	1.518	1.504
-11	1.785	1.769	1.753	1.737	1.722	1.707	1.691	1.676	1.661	1.646
-10	1.950	1.934	1.916	1.899	1.883	1.866	1.849	1.833	1.817	1.800
-9	2.131	2.112	2.093	2.075	2.057	2.039	2.021	2.003	1.985	1.968
-8	2.326	2.306	2.285	2.266	2.246	2.226	2.207	2.187	2.168	2.149
-7	2.537	2.515	2.493	2.472	2.450	2.429	2.408	2.387	2.367	2.346
-6	2.765	2.742	2.718	2.695	2.672	2.649	2.626	2.603	2.581	2.559
-5	3.013	2.987	2.962	2.937	2.912	2.887	2.862	2.838	2.813	2.790
-4	3.280	3.252	3.225	3.198	3.171	3.144	3.117	3.091	3.065	3.039
-3	3.568	3.539	3.509	3.480	3.451	3.422	3.393	3.364	3.336	3.308
-2	3.880	3.848	3.816	3.785	3.753	3.722	3.691	3.660	3.630	3.599
-1	4.217	4.182	4.147	4.113	4.079	4.045	4.012	3.979	3.946	3.913
-0	4.579	4.542	4.504	4.467	4.431	4.395	4.359	4.323	4.287	4.252

THE VAPOR PRESSURE OF LIQUID WATER FROM -16 TO 0°C (IN MM Hg)

Computed from the above table with the aid of the thermodynamic equation

$$\log_{10} \frac{p_w}{p_i} = \frac{-1.1489t}{273.1 + t} - 1.330 \times 10^{-5}t^2 + 9.084 \times 10^{-8}t^3 \quad (3)$$

<i>t</i> , °C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
-15	1.436	1.425	1.414	1.402	1.390	1.379	1.368	1.356	1.345	1.334
-14	1.560	1.547	1.534	1.522	1.511	1.497	1.485	1.472	1.460	1.449
-13	1.691	1.678	1.665	1.651	1.637	1.624	1.611	1.599	1.585	1.572
-12	1.834	1.819	1.804	1.790	1.776	1.761	1.748	1.734	1.720	1.705
-11	1.987	1.971	1.955	1.939	1.924	1.909	1.893	1.878	1.863	1.848
-10	2.149	2.134	2.116	2.099	2.084	2.067	2.050	2.034	2.018	2.001
-9	2.326	2.307	2.289	2.271	2.254	2.236	2.219	2.201	2.184	2.167
-8	2.514	2.495	2.475	2.456	2.437	2.418	2.399	2.380	2.362	2.343
-7	2.715	2.695	2.674	2.654	2.633	2.613	2.593	2.572	2.553	2.533
-6	2.931	2.909	2.887	2.866	2.843	2.822	2.800	2.778	2.757	2.736
-5	3.163	3.139	3.115	3.092	3.069	3.046	3.022	3.000	2.976	2.955
-4	3.410	3.384	3.359	3.334	3.309	3.284	3.259	3.235	3.211	3.187
-3	3.673	3.647	3.620	3.593	3.567	3.540	3.514	3.487	3.461	3.436
-2	3.956	3.927	3.898	3.871	3.841	3.813	3.785	3.757	3.730	3.702
-1	4.258	4.227	4.196	4.165	4.135	4.105	4.075	4.045	4.016	3.986
-0	4.579	4.546	4.513	4.480	4.448	4.416	4.385	4.353	4.320	4.289

THE VAPOR PRESSURE OF LIQUID WATER FROM 0°C TO 100°C (IN MM Hg)

From the Physikalisch-Technische Reichsanstalt "Wärmetabellen," Holborn, Scheel and Henning, Vieweg und Sohn, Braunschweig, 1909. By permission

<i>t</i> , °C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0	4.579	4.613	4.647	4.681	4.715	4.750	4.785	4.820	4.855	4.890
1	4.926	4.962	4.998	5.034	5.070	5.107	5.144	5.181	5.219	5.256
2	5.294	5.332	5.370	5.408	5.447	5.486	5.525	5.565	5.605	5.645
3	5.685	5.725	5.766	5.807	5.848	5.889	5.931	5.973	6.015	6.058
4	6.101	6.144	6.187	6.230	6.274	6.318	6.363	6.408	6.453	6.498
5	6.543	6.589	6.635	6.681	6.728	6.775	6.822	6.869	6.917	6.965
6	7.013	7.062	7.111	7.160	7.209	7.259	7.309	7.360	7.411	7.462
7	7.513	7.565	7.617	7.669	7.722	7.775	7.828	7.882	7.936	7.990
8	8.045	8.100	8.155	8.211	8.267	8.323	8.380	8.437	8.494	8.551
9	8.609	8.668	8.727	8.786	8.845	8.905	8.965	9.025	9.086	9.147
10	9.209	9.271	9.333	9.395	9.458	9.521	9.585	9.649	9.714	9.779
11	9.844	9.910	9.976	10.042	10.109	10.176	10.244	10.312	10.380	10.449
12	10.518	10.588	10.658	10.728	10.799	10.870	10.941	11.013	11.085	11.158
13	11.231	11.305	11.379	11.453	11.528	11.604	11.680	11.756	11.833	11.910
14	11.987	12.065	12.144	12.223	12.302	12.382	12.462	12.543	12.624	12.706

THE VAPOR PRESSURE OF LIQUID WATER FROM 0°C TO 100°C (IN MM Hg).—(Continued)

$t, ^\circ\text{C}$	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
15	12.788	12.870	12.953	13.037	13.121	13.205	13.290	13.375	13.461	13.547
16	13.634	13.721	13.809	13.898	13.987	14.076	14.166	14.256	14.347	14.438
17	14.530	14.622	14.715	14.809	14.903	14.997	15.092	15.188	15.284	15.380
18	15.477	15.575	15.673	15.772	15.871	15.971	16.071	16.171	16.272	16.374
19	16.477	16.581	16.685	16.789	16.894	16.999	17.105	17.212	17.319	17.427
20	17.535	17.644	17.753	17.863	17.974	18.085	18.197	18.309	18.422	18.536
21	18.650	18.765	18.880	18.996	19.113	19.231	19.349	19.468	19.587	19.707
22	19.827	19.948	20.070	20.193	20.316	20.440	20.565	20.690	20.815	20.941
23	21.068	21.196	21.324	21.453	21.583	21.714	21.845	21.977	22.110	22.243
24	22.377	22.512	22.648	22.785	22.922	23.060	23.198	23.337	23.476	23.616
25	23.756	23.897	24.039	24.182	24.326	24.471	24.617	24.764	24.912	25.060
26	25.209	25.359	25.509	25.660	25.812	25.964	26.117	26.271	26.426	26.582
27	26.739	26.897	27.055	27.214	27.374	27.535	27.696	27.858	28.021	28.185
28	28.349	28.514	28.680	28.847	29.015	29.184	29.354	29.525	29.697	29.870
29	30.043	30.217	30.392	30.568	30.745	30.923	31.102	31.281	31.461	31.642
30	31.824	32.007	32.191	32.376	32.561	32.747	32.934	33.122	33.312	33.503
31	33.695	33.888	34.082	34.276	34.471	34.667	34.864	35.062	35.261	35.462
32	35.663	35.865	36.068	36.272	36.477	36.683	36.891	37.099	37.308	37.518
33	37.729	37.942	38.155	38.369	38.584	38.801	39.018	39.237	39.457	39.6772
34	39.898	40.121	40.344	40.569	40.796	41.023	41.251	41.480	41.710	41.94
35	42.175	42.409	42.644	42.880	43.117	43.355	43.595	43.836	44.078	44.320
36	44.563	44.808	45.054	45.301	45.549	45.799	46.050	46.302	46.556	46.811
37	47.067	47.324	47.582	47.841	48.102	48.364	48.627	48.891	49.157	49.424
38	49.692	49.961	50.231	50.502	50.774	51.048	51.323	51.600	51.879	52.160
39	52.442	52.725	53.009	53.294	53.580	53.867	54.156	54.446	54.737	55.030
40	55.324	55.61	55.91	56.21	56.51	56.81	57.11	57.41	57.72	58.03
41	58.34	58.65	58.96	59.27	59.58	59.90	60.22	60.54	60.86	61.18
42	61.50	61.82	62.14	62.47	62.80	63.13	63.46	63.79	64.12	64.46
43	64.80	65.14	65.48	65.82	66.16	66.51	66.86	67.21	67.56	67.91
44	68.26	68.61	68.97	69.33	69.69	70.05	70.41	70.77	71.14	71.51
45	71.88	72.25	72.62	72.99	73.36	73.74	74.12	74.50	74.88	75.26
46	75.65	76.04	76.43	76.82	77.21	77.60	78.00	78.40	78.80	79.20
47	79.60	80.00	80.41	80.82	81.23	81.64	82.05	82.46	82.87	83.29
48	83.71	84.13	84.56	84.99	85.42	85.85	86.28	86.71	87.14	87.58
49	88.02	88.46	88.90	89.34	89.79	90.24	90.69	91.14	91.59	92.05
50	92.51	97.20	102.09	107.20	112.51	118.04	123.80	129.82	136.08	142.60
60	149.38	156.43	163.77	171.38	179.31	187.54	196.09	204.96	214.17	223.73
70	233.7	243.9	254.6	265.7	277.2	289.1	301.4	314.1	327.3	341.0
80	355.1	369.7	384.9	400.6	416.8	433.6	450.9	468.7	487.1	506.1
90	525.76	527.76	529.77	531.78	533.80	535.82	537.86	539.90	541.95	544.00
91	546.05	548.11	550.18	552.26	554.35	556.44	558.53	560.64	562.75	564.87
92	566.99	569.12	571.26	573.40	575.55	577.71	579.87	582.04	584.22	586.41
93	588.60	590.80	593.00	595.21	597.43	599.66	601.89	604.13	606.38	608.64
94	610.90	613.17	615.44	617.72	620.01	622.31	624.61	626.92	629.24	631.57
95	633.90	636.24	638.59	640.94	643.30	645.67	648.05	650.43	652.82	655.22
96	657.62	660.03	662.45	664.88	667.31	669.75	672.20	674.66	677.12	679.59
97	682.07	684.55	687.04	689.54	692.05	694.57	697.10	699.63	702.17	704.71
98	707.27	709.83	712.40	714.98	717.56	720.15	722.75	725.36	727.98	730.61
99	733.24	735.88	738.53	741.18	743.85	746.52	749.20	751.89	754.58	757.29
100	760.00	762.72	765.45	768.19	770.93	773.68	776.44	779.22	782.00	784.78
101*	787.57	790.37	793.18	796.00	798.82	801.66	804.50	807.35	810.21	813.08

* For higher temperatures, v. p. 233.

LITERATURE

(For a key to the periodicals see end of volume)

(1) Scheel and Heuse, 16, 29: 731; 09. (2) Weber, 168, No. 150: 37; 15. (3) Washburn, 406, 52: 488; 24.

VAPOR PRESSURES OF CHEMICAL COMPOUNDS IN THE LIQUID STATE FOR PRESSURES UP TO TWO ATMOSPHERES

OTTO MAASS

In addition to the vapor-pressure data for the compounds given, the B-Table is a complete index to the vapor-pressure data for all pure chemical compounds in the liquid state. The literature references given first are those upon which the values given are based; confirmatory references are marked *cf.*

B-TABLE, STANDARD ARRANGEMENT (v. p. viii)

$$\log_{10} p_{\text{mm}} = \frac{-0.05223A}{T} + B$$

The tables contain either the values of A and B in the above equation (together with the range of applicability of the equation), tabulated values of *t* and *p*, or both.

The values in the B. P. column are based on the best available direct determinations of the boiling point. These values not infrequently differ considerably from those interpolated from the vapor-pressure data, a situation which can be cleared up only by further research.

Formula	Range, °C	A, joule	B	Normal B. P., °C	Lit.
H ₂ O.....	v. p. 210				
H ₂ O ₂	10 to 90	48530	8.853		(31)
HF.....	-83 to +48	25180	7.370		(60)
ClO ₂	-59 to +11	27260	7.898		(29)
HCl.....	<i>t</i> , °C -108 -104 -100 -96 -88	<i>p</i> , mm 168.5 226.2 329.8 503.4 640.3		-85.0	(25); <i>cf.</i> (32, 64)
HBr.....	-86 to -66	17960	7.427		(32); <i>cf.</i> (63, 64)
HI.....	-50 to -34	21580	7.630		(32); <i>cf.</i> (63)
SO ₂	<i>t</i> , °C -70 -65 -60 -55 -50 -45 -40 -35	<i>p</i> , mm 19.9 30.0 42.8 61.8 86.7 119.6 162.3 217.1	<i>t</i> , °C -30 -25 -20 -15 -10 -5 0	<i>p</i> , mm 286.0 373.0 478.0 607.0 761.0 947.0 1164.0	-10.02 (7, 25, 37)
SO ₃	24 to 48	43450	10.022		(8)
H ₂ S.....	<i>t</i> , °C -82 -78 -74 -70	<i>p</i> , mm 172 235 339 432	<i>t</i> , °C -66 -62 -58	<i>p</i> , mm 535 660 830	-59.4 (32); <i>cf.</i> (63, 64)
S ₂ Cl ₂	0 to 138	35990	7.455		(23)
SOBr ₂					(85)
H ₂ Se.....	-66 to -26	20210	7.431		(11)
H ₂ SeO ₃	70 to 110	43000	8.150		(27)
SeOCl ₂	<i>t</i> , °C 85 95 105 115 125	<i>p</i> , mm 22.0 37.4 58.9 94.4 114.0	<i>t</i> , °C 135 145 155 165	<i>p</i> , mm 176.4 213.0 304.0 418.0 560.0	(30)
H ₂ Te.....	-46 to 0	22760	7.260		(10)
N ₂ O.....	-90.1 to -88.7	16440	7.535		(12); <i>cf.</i> (7, 46)
NO.....	-163.7 to -148	13040	8.440		(21, 24)
N ₂ O ₃	-25 to 0	39400	10.30		(22)
N ₂ O ₄	-8 to +43.2	33430	8.814		(5, 56); <i>cf.</i> (45, 85.5)

Formula	Range, °C	A, joule	B	Normal B. P., °C	Lit.
H ₃ N.....	<i>t</i> , °C -77 -74 -71 -68 -65 -62 -59 -56 -53 -50	<i>p</i> , mm 47.8 60.5 76.7 94.7 117.1 143.8 175.5 212.7 256.3 307.0	<i>t</i> , °C -47 -44 -41 -38 -35 -32 -29 -26 -23 -20	<i>p</i> , mm 365.5 432.9 510.3 598.6 699.1 812.9 941.3 1085.0 1247.0 1427.0	(13, 25); <i>cf.</i> (7, 12, 43)
NOCl.....	-61.5 to -5.4	25500	7.870		(80); <i>cf.</i> (9)
P ₂ O ₃	<i>t</i> , °C 30 50 60	<i>p</i> , mm 3 9.0 20	<i>t</i> , °C 70 80 90	<i>p</i> , mm 60 150 300	(57)
PH ₃	<i>t</i> , °C -133 -129 -125 -121 -117 -113	<i>p</i> , mm 29.3 43.0 61.3 85.7 117.5 158.3	<i>t</i> , °C -109 -105 -101 -97 -93 -89	<i>p</i> , mm 209.9 274.6 354.2 450.4 564.5 699.5	(25); <i>cf.</i> (64)
PCl ₃	0-70	31860	7.681	73.5	(46)
As ₂ O ₃	315 to 490	52120	6.513		(55)
AsCl ₃	50 to 100	39110	7.953		(6)
SbCl ₃	170 to 253 <i>t</i> , °C 120 130 140 150 160	49440 <i>p</i> , mm 29 43 64 92 127	8.090		(49)
SbBr ₃	235 to 324 <i>t</i> , °C 180 190 200	55000 <i>p</i> , mm 42 59 82	8.005 <i>t</i> , °C 210 220 230	<i>p</i> , mm 111 148 195	(49)
SbI ₃	330 to 445 <i>t</i> , °C 250 265 280	64150 <i>p</i> , mm 23 35 53	7.831 <i>t</i> , °C 295 310 325	<i>p</i> , mm 80 115 166	(49)
CO.....	-290 to -206	6354	6.976		(18); <i>cf.</i> (3, 39)
CO ₂ , v. p. 235					
C ₃ O ₂	-100 to +6	25460	7.640	6.3	(77)
CCl ₄ , see also p. 215	<i>t</i> , °C -20 0 +30	<i>p</i> , mm 9.9 33.1 139.5	<i>t</i> , °C 60 90 110	<i>p</i> , mm 439.0 1112 1880	(16, 84)
CCl ₂ O.....	-15 to +22	25390	7.595	v. p. 215	(41)
CS ₂	<i>t</i> , °C -70 -60 -50 -40 -30 -20 -10 0	<i>p</i> , mm 1.6 3.5 7.1 14.0 26.2 46.5 78.8 127.3	<i>t</i> , °C +10 20 30 40 50 60 70	<i>p</i> , mm 198.1 297.5 432.7 616.7 854.0 1173.0 1570.0	(4, 25, 37, 59); <i>cf.</i> (46, 47)
COS.....	-80 to -50 <i>t</i> , °C -130 -110 -90	19220 <i>p</i> , mm 1.5 13.0 73.0	7.383		(68)

Formula	Range, °C	A, joule	B	Normal B. P., °C	Lit.
CSSe.....	<i>t</i> , °C 0 +15 30 50 70	<i>p</i> , mm 26 55 112 246 485		84.5	(78)
(CN) ₂	-32 to -6	23750	7.808		(79)
HCN.....	-8 to +27	27830	7.7446		(42); cf. (87)
CNCl.....	-5 to +40	27100	7.840		(46)
For other C-compounds, v. the C-Table, p. 215					
SiO ₂	1860 to 2230	506000	13.43	2230	(52)
H ₄ Si.....	-160 to -112	12690	6.996		(71); cf. (1)
H ₆ Si ₂	-115 to -14.6	21700	7.258		(71)
H ₈ Si ₃	-70 to +52	29850	7.676		(71, 76)
(SiH ₃) ₂ O.....	-110 to -15	23590	7.686		(75)
SiCl ₄	-70 to +5	30100	7.644		(46, 75)
Si ₂ Cl ₆	40 to 103	45900	8.700	139	(33)
Si ₃ Cl ₈	124 to 149	50500	8.300	213	(33)
(SiCl ₃) ₂ O.....	30 to 137 <i>t</i> , °C 0 10 20	39850 <i>p</i> , mm 1.5 3.0 6.0	7.980		(75)
SiH ₃ Cl.....	-110 to -30	21400	7.488		(73)
SiH ₂ Cl ₂	-100 to +8	25500	7.613		(73)
SiH ₃ Br.....	-90 to +2	24430	7.524		(71)
SiH ₂ Br ₂	-65 to +18	31010	7.654		(72)
(SiH ₃) ₃ N.....	-60 to +15	30620	7.883		(74)
For methylsilicanes, v. p. 215					
Ge ₂ H ₆	-98 to +30	26400	7.444		(14)
Ge ₃ H ₈	0 to 111	31900	7.224		(14)
GeCl ₄	10.4 to 86	38500	7.340		(38)
SnH ₄	-148 to -49	19140	7.400		(40)
SnCl ₄	<i>t</i> , °C -10 +10 30 60	<i>p</i> , mm 2.8 10.3 31.3 112.0	<i>t</i> , °C 90 120 140	<i>p</i> , mm 360.5 895.0 1497.0	(84)
PbF ₂	1078 to 1289	165100	8.391	1292	(82)
PbCl ₂	500 to 950	141900	8.961	945	(17); cf. (82)
PbBr ₂	735 to 918	118000	8.064	916	(82)
TlF.....	282 to 298	105000	12.52	298	(82)
TlCl.....	665 to 807	105200	7.974	806	(82)
TlBr.....	634 to 817	105400	7.940	815	(82)
TlI.....	693 to 822	105400	7.902	824	(82)
CdI ₂	385 to 450	122200	9.269		(58)
HgCl.....	<i>t</i> , °C 310 330 350 370	<i>p</i> , mm 103.0 189.2 329.9 548.9		383	(61); cf. (2, 48)
HgCl ₂	275 to 309	61020	8.409		(28, 44, 65)
HgBr ₂	238 to 331	61250	8.284		(28, 44, 65)
HgI ₂	266 to 360	62770	8.115		(28, 44, 65)
Cu ₂ Cl ₂	878 to 1369	80700	5.454	1366	(82)
Cu ₂ Br ₂	997 to 1351	79900	5.460	1345	(82)
Cu ₂ I ₂	991 to 1154	80700	5.570	1293	(82)
AgCl.....	1255 to 1442	185500	8.179	1554	(82)
OsF ₈	38 to 47.3	29200	7.650		(54)
Co(CO) ₃ NO.....	14 to 66	30210	7.366		(36)
Ni(CO) ₄	2 to 40	29800	7.780	43	(15); cf. (34)
CrO ₂ Cl ₂	79 to 116	36230	7.735	116.7	(35)
NbF ₅	<i>t</i> , °C 182 200 210	<i>p</i> , mm 290 420 540		219	(51)

Formula	Range, °C	A, joule	B	Normal B. P., °C	Lit.
TaF ₅	<i>t</i> , °C 182 200	<i>p</i> , mm 370 460	<i>t</i> , °C 218 229	<i>p</i> , mm 580 750	(51)
B ₂ H ₆	-112 to -87	13050	6.556		(66)
B ₅ H ₁₁					(86)
BCl ₃	<i>t</i> , °C -80 -60 -30 -15 0	<i>p</i> , mm 4.0 18.0 116.0 251.0 477.0		+12.7	(70)
BBr ₃	-40 to +90	33320	7.655		(67)
B ₂ H ₅ Br.....	-80 to -5	26260	7.640		(69)
B ₃ N ₃ H ₆					(86)
For B(C ₆ H ₅) _x , v. p. 215					
Al ₂ O ₃	1840 to 2200	540000	14.22	2210	(52)
LiF.....	1398 to 1666	218400	8.753	1670	(53); cf. (83)
LiCl.....	1045 to 1325	155900	7.939	1337	(50); cf. (83)
LiBr.....	1010 to 1265	152700	8.068	1265	(50); cf. (83)
LiI.....	940 to 1140	143600	8.011	1189	(50); cf. (83)
NaOH.....	1010 to 1402	132000	7.030	1390	(81)
NaF.....	1562 to 1701	218200	8.640	1705	(53); cf. (83)
NaCl.....	1156 to 1430 976 to 1155	185800 180300	8.548 8.3297	1439	(81); cf. (50) (19)
NaBr.....	1138 to 1394	161600	7.948	1393	(81); cf. (50)
NaI.....	1063 to 1307	165100	8.371	1297	(81); cf. (50)
NaCN.....	800 to 1360	155520	7.472	1496	(26)
KOH.....	1170 to 1327	136000	7.330	1322	(81)
KF.....	1278 to 1500	207500	9.000	1498	(53); cf. (83)
KCl.....	1116 to 1418 906 to 1105	169700 174500	8.130 8.3526	1416	(81); cf. (50) (19)
KBr.....	1095 to 1375 906 to 1063	163800 168100	7.936 8.2470	1381	(81); cf. (50) (19)
KI.....	1063 to 1333 843 to 1028	155700 157600	7.949 8.0957	1331	(81); cf. (50) (19)
RbF.....	1142 to 1400	183200	8.570	1408	(53); cf. (83)
RbCl.....	1142 to 1395	198600	9.111	1388	(50); cf. (83)
RbBr.....	1050 to 1365	165000	8.223	1340	(50); cf. (83)
RbI.....	1075 to 1325	156600	8.067	1304	(50); cf. (83)
CsF.....	1033 to 1255	140900	7.703	1253	(53); cf. (83)
CsCl.....	986 to 1295	163200	8.340	1289	(50); cf. (83)
CsBr.....	978 to 1305	153600	7.990	1297	(50); cf. (83)
CsI.....	1052 to 1280	185700	9.124	1280	(50); cf. (83)

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VAPOR PRESSURES OF ORGANIC LIQUIDS

H. R. RAIKES AND E. J. BOWEN

C-TABLE

The C-arrangement, v. p. viii

$$\log_{10} p_{\text{mm}} = -\frac{0.05223}{T} A + B$$

The values in the B. P. column are based upon the best available direct determinations of the boiling point. These values not infrequently differ considerably from those interpolated from the vapor-pressure data, a situation which can be cleared up only by further research.

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
CCl ₂ O Carbonyl chloride (3, 76, 78); cf. (80)			
-90 to +25	24 684	7.460	8.45
CCl ₃ NO ₂ Chloropicrin (5, 124)			
-20	1.5		111.91
-10	3.0		
0	5.7		
+10	10.4		
20	13.8		
25	18.3		
30	31.1		
35	40.15		
CCl ₄ Carbon tetrachloride (28, 44, 72, 87, 124, 126, 136)			
-70 to -19	36 585	8.540	76.75
-19 to +20	33 914	8.004	
20	91		
25	114.5		
30	143.0		
35	176.2		
40	215.8		
45	262.5		
50	317.1		
55	379.3		
60	450.8		
65	530.9		
70	622.3		
80	843		
90	1 122		
100	1 463		
CN ₄ O ₈ Tetranitromethane (65)			
40	26.6		125.7
50	44.2		
60	70.6		
70	109	100	339
80	164	110	470
90	239	120	640

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
CHBr ₃ Bromoform, 9.4 mm at 25.0° (97)			
CHCl ₃ Chloroform (7, 28, 44, 89); cf. (87, 126)			
-60	0.81		61.20
-50	2.06		
-40	4.7		
-30	10.0		
-20	19.6		
-10	34.75		
0	61.0	t , °C	p_{mm}
+10	100.5	45	439.0
20	159.6	50	526.0
25	199.1	55	625.2
30	246.0	60	739.6
35	301.3	60.9	760.0
40	366.4	70	1 019
		80	1 403
HCN Hydrocyanic acid (41); cf. (80, 140)			
0 to 46	27 875	7.7526	25.75
CH ₂ Br ₂ Methylene bromide (89)			
0	11.5		
10	20.4		
20	34.7		
30	56.4		
CH ₂ Cl ₂ Methylene chloride (89, 116)			
0	147		
10	229.7		
20	348.9		
30	511.4		
CH ₂ O ₂ Formic Acid (29, 34, 53, 55, 57, 92); cf. (96)			
10	18.9		100.5
20	33.1		
30	52.2		
40	82.6		
50	125.9		
60	189.7		
70	279.6		
80	398.1		
90	552.1		
100	753.4		
CH ₃ AsCl ₂ Methylarsine dichloride (5)			
-17 to +35	43 686	8.6944	
CH ₃ Cl Methyl chloride (47, 100); cf. (87)			
-47 to -10	21 988	7.481	-23.47

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
CH ₃ F Methyl fluoride (69)			
-102 to -76	17 053	7.445	-77.96
CH ₃ I Methyl iodide (15, 89, 93)			
0	141.2		42.35
10	220.2		
20	331.4		
30	483.4		
CH ₃ NO ₂ Nitromethane (131)			
47 to 100	36 914	8.033	101.1
CH ₄ Methane (25, 48, 113)			
-174 to -163	8 516.9	6.8626	-161.4
-176	190.5		
-178	152.1		
-182	94.0		
-183.15	70		
CH ₄ Cl ₂ Si Methyl dichlorosilicane (114)			
-70	1.2		
-60	3.0		
-40	14.3		
-20	49.0		
0	140.0		
+10	210.0		
20	309.0		
CH ₄ O Methyl alcohol (2, 28, 72, 91, 92, 106, 112, 126, 129, 136, 137)			
-62 to -44	39 234	8.9547	64.6
-10 to +80	38 324	8.8017	
CH ₄ S Methylmercaptan (13)			
0	595		6.8
10	855		
20	1 270		
CH ₅ ClSi Methyl chlorosilicane (114)			
-90	2.0		
-80	4.5		
-60	23.2		
-40	84.3		
-30	146.6		
-20	237.1		
-10	363.0		
CH ₅ N Methylamine, 720 mm at -7.55° (12)			
CH ₆ Si Methylsilicane (114)			
-130	4.15		-56.9
-110	28.8		
-90	131.8		
-80	234.4		
-70	411.2		
-60	660.7		
C ₂ Cl ₄ Tetrachloroethylene (44)			
40	41		118.8
50	67		
60	104		
70	155.3		
80	226		
90	319.2		
100	438.5		
110	591.6		
C ₂ N ₂ Cyanogen (21, 79); cf. (30, 123)			
-25	629.8		-21.2
-20	800.0		
-15	1 005.0		
-10	1 230.0		

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C ₂ HCl ₃ Trichloroethylene (44)			
25	73		87.15
30	94		
40	149		
50	224		
60	324.5		
70	453.0		
80	618.0		
C ₂ HCl ₅ Pentachloroethane (44, 109)			
70	39		161.75
90	90		
100	130		
110	176.2		
120	236.6		
130	316.2		
140	421.7		
150	555.9		
160	724.4		
170	929		
180	1 183		
C ₂ H ₂ Cl ₂ <i>cis</i> -Dichloroethylene (45)			
23 to 49	29 216	7.624	48.35
C ₂ H ₂ Cl ₂ <i>trans</i> -Dichloroethylene (45)			
27 to 59	31 006	7.752	60.25
C ₂ H ₂ Cl ₄ 1, 1, 2, 2-Tetrachloroethane (44)			
26 to 145	39 729	7.846	145.0
C ₂ H ₂ Cl ₄ 1, 1, 1, 2-Tetrachloroethane (109)			
105 to 145	36 508	7.605	130.5
C ₂ H ₃ ClO Acetyl chloride, 760 mm at 50.92° (124)			
C ₂ H ₃ Cl ₃ 1, 1, 1-Trichloroethane (109)			
55 to 85	31 142	7.564	74.2
C ₂ H ₃ Cl ₃ 1, 1, 2-Trichloroethane (109)			
90 to 130	35 371	7.656	113.7
C ₂ H ₃ N Acetonitrile, 760 mm at 81.60° (126)			
C ₂ H ₄ Ethylene (17, 60, 113)			
-160 to -104	14 396	7.330	-103.9
C ₂ H ₄ BrCl 1-Bromo-1-chloroethane (109)			
75 to 95	33 051	7.7325	82.7
C ₂ H ₄ Br ₂ Ethylene bromide (87, 127)			
10 to 150	38 082	7.792	131.70
-10	2.5		
0	3.9		
C ₂ H ₄ Cl ₂ 1, 1-Dichloroethane (88, 109)			
0 to 30	31 706	7.909	57.65
40 to 70	30 625	7.7165	
C ₂ H ₄ Cl ₂ 1, 2-Dichloroethane (89, 109, 126)			
0 to 30	35 598	8.126	83.70
64 to 86	32 996	7.705	
C ₂ H ₄ O Acetaldehyde (35)			
-24.3 to +27.5	27 707	7.8206	19.8
C ₂ H ₄ O Ethylene oxide (59)			
-60	15.3		10.75
-40	64.1		
-20	196.4		
-10	316.3		
0	493.1		
+10	738.0		

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C₂H₄O₂ Acetic acid (53, 57, 92, 136); cf. (96)			
20	11.7		118.5
30	20.6		
40	34.8		
50	56.6		
60	88.9		
70	136.0		
80	202.3		
90	293.7		
100	417.1		
110	580.8		
120	794.0		
130	1 067.6		
140	1 414		
C₂H₄O₂ Methyl formate (126, 136)			
–20	67.7		31.75
–10	117.6		
0	195.0		
+10	309.4		
20	476.4		
30	707.9		
40	1 029		
50	1 451		
C₂H₅Br Ethyl bromide (87, 89, 90, 126, 129)			
–20	59		38.40
–10	101		
0	165		
+10	257		
20	386		
30	564		
40	802		
50	1 113		
60	1 512		
C₂H₅Cl Ethyl chloride (12, 52)			
–30 to +30	26 319	7.691	12.7
C₂H₅I Ethyl iodide (87, 89, 93, 125, 129)			
0	41.5		72.5
10	68.5		
20	108.5		
30	167.5		
40	251.5		
50	364.0		
60	512.0		
C₂H₆ Ethane (57.5); cf. (17, 60, 115)			
–140	14.1		–88.63
–130	39.5		
–120	94.7		
–110	202.8		
–100	393.8		
–90	705.2		
–80	1 182		
–75	1 499		
C₂H₆O Ethyl alcohol (16, 28, 58, 59, 67, 71, 78, 129, 136, 137); cf. (87)			
–65	0.021		78.32
–60	0.045		
–55	0.087		
–50	0.12		
–45	0.24		
–40	0.39		
–35	0.63		

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
–30	1.04	<i>t</i> , °C	<i>p</i> _{mm}
–25	1.63	35	103.7
–20	2.5	40	135.3
–15	3.65	45	174.0
–10	5.6	50	222.2
–5	8.3	55	280.6
0	12.2	60	352.7
+5	17.3	65	448.8
10	23.6	70	542.5
15	32.2	75	666.1
20	43.9	80	812.6
25	59.0	85	986.3
30	78.8	90	1 187
C₂H₆O Methyl ether (59); cf. (87)			
–70 to –20	23 025	7.720	–24.6
C₂H₆O₂ Glycol (32)			
120	39		197.0
130	62		
140	96.8		
150	147.9		
160	218.8		
170	316.2		
180	446.2		
190	615.9		
C₂H₆S Methyl sulfide (13)			
0	172		35.9
10	275.4		
20	418.8		
30	616.6		
40	873		
C₂H₆S Ethylmercaptan (13)			
8 to 45	28 210	7.672	34.4
C₂H₇N Dimethylamine (12)			
6.05	724		
15.6	1 216		
C₂H₇N Ethylamine (12, 126)			
15.45	724		16.55
C₂H₈Si Dimethylsilicane (114)			
–110	1.6		–20
–80	29.5		
–50	187.5		
–40	316.2		
–30	510.0		
C₃H₄ Allylene (60)			
–73 to –13	21 372	7.4295	–27.5
C₃H₄Br₂ 2, 3-Dibromopropylene (54)			
40	17.2		141.2
60	46.8		
80	105.0		
100	218.8		
120	415.9		
130	555.9		
C₃H₅Cl 3-Chloropropylene, 760 mm at 44.60° (127)			
C₃H₅ClO α-Epichlorohydrin, 760 mm at 116.56° (124)			
C₃H₅N Propionitrile, 760 mm at 97.20° (127)			

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C₃H₆ Propylene (18, 60)			
-95 to -48	19 693	7.4463	-47.7
-127.4	3		
-110.4	15		
-34.4	1 307		
C₃H₆Br₂ 1, 3-Dibromopropane (54)			
60	18.5		164.4
80	45.8		
100	101.9		
120	205.1		
140	384.6		
150	515.2		
C₃H₆O Acetone (6, 28, 50, 82, 91, 95, 112, 126); cf. (87, 121)			
-90	0.021		56.10
-70	0.34	t , °C	p_{mm}
-50	2.4	35	346.4
-30	11.2	40	421.5
-10	38.7	45	510.5
5	89.1	50	612.6
+10	115.6	56.30	760
15	147.1	60	860.6
20	184.8	70	1 190
25	229.2	80	1 611
30	282.7		
C₃H₆O₂ Propionic acid (53, 54, 96)			
20 to 140	46 150	8.715	140.0
C₃H₆O₂ Ethyl formate (136)			
-20	22.5		54.5
-10	41.5		
0	72.4		
+10	120.3		
20	192.5		
30	297.5		
40	446.7		
50	649.4		
60	917.9		
70	1 266		
C₃H₆O₂ Methyl acetate (136)			
-20	19		57.1
-10	35.1		
0	62.1		
+10	104.8		
20	169.8		
30	265.8		
40	400.4		
50	588.2		
60	837.5		
70	1 167		
C₃H₇Br Propyl bromide (89, 127)			
0 to 30	32 430	7.821	71.00
C₃H₇Br Isopropyl bromide (89)			
0 to 30	30 760	7.722	
C₃H₇Cl Propyl chloride (12, 43, 89)			
0 to 50	28 894	7.593	47.2
64.2	1 414		
C₃H₇Cl Isopropyl chloride (89)			
0 to 30	27 242	7.493	
C₃H₇I Propyl iodide (89)			
0 to 30	35 334	7.826	

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C₃H₇I Isopropyl iodide (89)			
0 to 30	32 978	7.629	
C₃H₇NO₂ Urethane (118)			
103	54		
120	103		
130	146		
140	203		
150	283		
160	392		
170	551		
176.8	697		
C₃H₇NO₃ Nitroglycerol (63); cf. (22)			
20	0.00025		
30	0.00083		
40	0.0024		
50	0.0073		
60	0.0188		
70	0.043		
80	0.098		
90	0.23 (some decomposition)		
C₃H₈ Propane (18, 60, 139)			
-136 to -40	19 037	7.217	-44.5
-38.4	1 050		
-30.85	1 368		
C₃H₈O <i>n</i>-Propyl alcohol (16, 72, 136, 137)			
-45 to -10	47 274	9.5180	97.19
0	3.44	t , °C	p_{mm}
+5	5.04	65	186.8
10	7.26	70	239.0
15	10.3	75	301.0
20	14.5	80	376.0
25	20.1	85	466
30	27.6	90	574
35	37.4	95	697
40	50.2	100	842.5
45	66.4	105	1 097
50	87.2	110	1 206
55	113.6	115	1 428
60	147.0		
C₃H₈O Isopropyl alcohol, 760 mm at 82.26° (16)			
C₃H₈O Methyl ethyl ether (13)			
0 to 25	26 262	7.769	7.5
C₃H₈O₂ Methylal, 760 mm at 42.30° (126)			
C₃H₉B Boron trimethyl (117)			
-118 to -20	22 171	7.4595	-20.2
C₃H₉N Propylamine, 726 mm at 47.05° (12)			
C₄H₂O₃ Maleic anhydride (130)			
60 to 160	46 340	7.825	
C₄H₆O₃ Acetic anhydride (8, 77)			
100 to 140	45 585	8.688	139.55
150	1 171		
C₄H₇N Butyronitrile, 760 mm at 117.00° (127)			
C₄H₈O Methyl ethyl ketone (79, 126)			
20	77.5		79.60
30	121.4		
40	188.4		
50	300.0		

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C₄H₈O₂ Butyric acid (53, 54, 85, 96)			
80 to 165	51 103	9.010	162.4
20	0.75		
30	1.5		
40	3.0		
50	5.25		
60	9.35		
C₄H₈O₂ Isobutyric acid (53, 54, 92, 126); cf. (96)			
30 to 155	48 498	8.8193	153.45
10	0.7		
C₄H₈O₂ Ethyl acetate (126, 128, 136)			
-20	6.5		77.15
-10	12.9		
0	24.2		
+10	42.8		
20	72.8		
30	118.7		
40	186.3		
		<i>t</i> , °C	<i>p</i> _{mm}
		50	282.3
		60	415.3
		70	596.3
		80	832.8
		90	1 133
		100	1 520
C₄H₈O₂ Methyl propionate (136)			
-20	5.6		79.75
-10	11.5		
0	21.9		
+10	38.8		
20	66.2		
30	107.8		
40	169.3		
50	256.7		
		<i>t</i> , °C	<i>p</i> _{mm}
		60	380.3
		70	548.0
		80	771.0
		90	1 048
		100	1 408
C₄H₈O₂ Propyl formate (136)			
-10	11.4		81.1
0	21.4		
+10	37.8		
20	63.9		
30	104.1		
40	163.6		
60	364.9		
70	523.9		
80	734.5		
90	1 003		
100	1 343		
C₄H₉Br Butyl bromide, 760 mm at 101.60° (127)			
C₄H₁₀ Butane (18, 139)			
-100 to +12	23 450	7.395	-0.3
C₄H₁₀ Isobutane (19, 98, 139)			
-115 to -34	21 273	7.25	-13.4
-30	463		
-25	544		
-20	646		
-15	745		
C₄H₁₀O <i>n</i>-Butyl alcohol (16, 54, 127)			
75 to 117.5	4 6774	9.1362	117.71
20	4.39		
25	6.44		
30	9.52		
35	13.1		
40	18.6		
45	24.9		
50	33.7		
		<i>t</i> , °C	<i>p</i> _{mm}
		55	44.9
		60	59.2
		65	77.7
		70	112.3
		75	131.3

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C₄H₁₀O Isobutyl alcohol (16, 68); cf. (96, 138)			
60	99.1		107.89
70	158.5		
80	248.9		
90	384.6		
100	583.5		
110	845.3		
120	1 197		
130	1 668		
C₄H₁₀O <i>sec.</i>-Butyl alcohol, 760 mm at 99.53° (16) <i>tert.</i>-Butyl alcohol, 760 mm at 82.55° (137)			
C₄H₁₀O Ethyl ether (28, 58, 72, 126, 136)			
-100	0.05		34.60
-80	0.6		
-60	4.1		
-40	19.0		
-30	37.6		
-10	112.3		
0	185.3		
+5	233.2		
10	291.7		
15	360.7		
		<i>t</i> , °C	<i>p</i> _{mm}
		20	442.2
		25	537.0
		30	647.3
		35	775.5
		40	921.3
		45	1 090
		50	1 277
C₄H₁₀O Methyl propyl ether (14)			
-0.5 to +40	28 952	7.729	38.8
C₄H₁₀S Ethyl sulfide (13)			
10	43.1		91.6
20	63.8		
30	94.0		
40	137.0		
50	199.5		
60	283.5		
70	393.6		
80	539.5		
90	724.4		
C₄H₁₁N Diethylamine (12)			
54.0	724		
75.2	1 345		
C₅H₄O₂ Furfural, 760 mm at 161.7° (61)			
C₅H₅N Pyridine, 760 mm at 115.50° (126)			
C₅H₉N Valeronitrile, 760 mm at 140.65° (127)			
C₅H₁₀O₂ Valeric acid (53, 54)			
60	2.07		184.4
80	9.3		
100	28.2		
120	70.5		
130	106.9		
140	159.6		
150	234.5		
160	336.1		
170	475.3		
180	660.7		
C₅H₁₀O₂ Isovaleric acid (53, 96)			
10	0.2		
30	0.75		
50	2.9		
70	9.4		
90	27.3		
110	69.8		
130	159.8		
150	338.3		

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C₅H₁₀O₂ Isobutyl formate (64)			
35	62		98.2
40	84		
50	139		
60	200		
70	294		
80	417		
90	586		
95	687		
C₅H₁₀O₂ Ethyl propionate (64, 126, 136)			
-10	4.05		99.10
0	8.3		
+10	15.55		
20	27.75		
40	77.9		
60	188.0		
80	403.6		
100	785.0		
120	1383		
C₅H₁₀O₂ Methyl <i>n</i>-butyrate (136)			
-10	3.5		102.65
0	7.3		
+10	13.8		
20	24.5		
30	41.9		
40	69.2		
50	109.6		
60	167.5		
C₅H₁₀O₂ Methyl isobutyrate (136)			
-10	6.2		92.2
0	12.1		
+10	22.4		
20	38.9		
30	65.4		
40	104.7		
50	162.0		
60	243.8		
C₅H₁₀O₂ Propyl acetate (1, 136)			
-10	3.6		101.7
0	7.0		
+20	25.0		
40	70.9		
60	171.9		
80	373.0		
90	525.0		
100	723.8		
110	976.1		
120	1 291		
C₅H₁₂ <i>n</i>-Pentane (136)			
-20 to +50	27 691	7.558	36.1
C₅H₁₂ Isopentane (126, 136)			
-30	58.55		27.95
-20	100.00		
-10	164.05		
0	257.35		
+10	390.4		
20	572.2		
30	819.0		
40	1 140.5		
50	1 535.7		

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C₅H₁₂O Amyl alcohol (38, 127)			
0	0.6		137.75
10	1.3		
20	2.8		
40	10.6		
60	34.1		
80	95.1		
100	233.3		
110	350.3		
120	512.3		
130	730.8		
C₅H₁₂O Isoamyl alcohol (96, 137)			
10	1.0		132.05
20	2.3		
40	9.7		
60	33.3		
80	95.9		
100	238.6		
110	358.6		
120	523.3		
130	743.2		
140	1 033		
150	1 400		
C₅H₁₂O Ethyl propyl ether (14)			
0	52.5		64.0
10	89.1		
20	143.3		
30	219.8		
40	326.6		
50	472.1		
60	666.0		
C₆H₄N₂O₆ 2, 3-Dinitrophenol, 0.128 mm at 100° (101)			
2, 4-Dinitrophenol, 0.294 mm at 100° (101)			
2, 5-Dinitrophenol, 0.506 mm at 100° (101)			
2, 6-Dinitrophenol, 0.117 mm at 100° (101)			
3, 4-Dinitrophenol, 0.00664 mm at 100° (101)			
3, 5-Dinitrophenol, 0.0098 mm at 100° (105)			
C₆H₅AsCl₂ Phenylarsine dichloride (5)			
0 to 45	60 578	9.150	
C₆H₅Br Bromobenzene (72, 94, 126, 136); cf. (54)			
-26 to -15	42 500	8.075	156.15
+30	5.67		
40	9.99		
50	16.96		
60	27.61		
70	43.55		
80	66.22		
90	97.72		
100	141.1		
110	198.7		
C₆H₅Cl Chlorobenzene (72, 126, 136)			
-35 to -15	42 250	8.500	132.00
0	2.52		
+10	4.86		
20	8.76		
30	15.45		
40	26.00		
50	41.98		
60	65.54		
70	97.90		
80	144.75		

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C₆H₅F Fluorobenzene (136)			
–20	6.15		85.2
–10	11.55	<i>t</i> , °C	<i>p</i> _{mm}
0	20.92	60	325.1
+10	36.40	70	463.5
20	60.54	80	644.9
30	96.61	90	883
40	149.6	100	1 177
50	223.9	110	1 542

C₆H₅I Iodobenzene (28, 72, 94, 136)			
–30 to +18	43 000	7.500	188.45
30	1.48	<i>t</i> , °C	<i>p</i> _{mm}
40	2.24	140	204.9
50	4.85	150	276.7
60	8.30	160	367.3
70	13.65	170	479.7
80	21.78	180	618.7
90	33.50	190	793.0
100	50.23	200	991.0
110	73.88	210	1 232.0
120	105.4	220	1 520.0
130	148.3		

C₆H₅NO₂ Nitrobenzene (54, 126)			
112 to 209	48 955	8.192	210.85
80	7.5		
90	12.9		
100	20.85		
110	32.5		

C₆H₅NO₃ *o*-Nitrophenol, 2.92 mm at 100° (101)*m*-Nitrophenol, 0.196 mm at 100° (101)*p*-Nitrophenol, 0.828 mm at 100° (101)

C₆H₆ Benzene (2, 26, 31, 54, 62, 91, 107, 127, 136)			
0 to 42	34 172	7.9622	80.25
42 to 100	32 295	7.6546	80.10
			80.15
			79.71*
			80.12

* Known to be very pure by freezing point.

C₆H₅ClN <i>o</i>-Chloroaniline (54, 104)			
80	7.7		208.8
90	13.0	<i>t</i> , °C	<i>p</i> _{mm}
100	20.7	160	199.1
110	32.1	170	269.8
120	48.4	180	358.5
130	71.0	190	472.1
140	101.9	200	608.2
150	144.6	210	778.0

C₆H₅ClN <i>m</i>-Chloroaniline (54, 104)			
95	7.0		228.5
100	9.0	<i>t</i> , °C	<i>p</i> _{mm}
110	14.8	180	203.5
120	23.1	190	274.2
130	35.1	200	363.1
140	52.1	210	476.4
150	75.9	220	616.6
160	107.2	230	783.4
170	149.6		

C₆H₅ClN *p*-Chloroaniline, 8.03 mm at 100° (104)

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C₆H₅N₂O₂ <i>o</i>-Nitroaniline (11, 104)			
150 to 260	63 881	8.8684	284.11
100	0.73		
265	466.7		
270	538.5		
275	627.4	(Some decomposition occurs)	
* 280	743.6		
285	922.0		

C₆H₅N₂O₂ <i>m</i>-Nitroaniline (11, 104)			
170 to 260	65 880	8.8188	306
100	0.16		
265	265.6		
270	304.2	(Some decomposition occurs)	
280	433.4		
290	653.2		

C₆H₅N₂O₂ <i>p</i>-Nitroaniline (11, 104)			
190 to 260	77 345	9.5595	
100	0.032		
265	116.8	(Rapid decomposition occurs)	
270	155.0		
275	210.6		

C₆H₅N₃ Phenyl azoimide (20)			
75	33.8		
80	41.8		
85	52.0		
90	63.6		
95	79.1		

C₆H₅O Phenol (9); cf. (54)			
116 to 180	49 644	8.587	181.2

C₆H₅O₂ Hydroquinol (110)			
150	4.0		
170	15.2		
190	37.7		
200	55.7		
210	79.8		
230	158.5		
250	291.8		
270	509.3		

C₆H₇N Aniline (9, 42, 126); cf. (84)			
145 to 185	45 951.6	8.1278	184.3
50	2.4		184.07
60	5.7		
70	10.6		
80	18.0		
90	29.2		
100	45.7		
110	69.2		
120	96.6		
130	144.5		
140	204.0		

C₆H₁₀O₄ Glycol diacetate (122)			
100	24		190.6
110	45	<i>t</i> , °C	<i>p</i> _{mm}
120	70	160	315
130	106	170	425
140	158	180	573
150	225	190	748

C₆H₁₀O₆ Methyl tartrate (38)			
155 to 175	50 670	7.36	

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C₆H₁₂ Butylethylene (132)			
0	52.6		65.9
10	86.9		
20	138.8		
30	212.7		
40	314.9		
50	452.1		
60	631.3		
65	738.9		
C₆H₁₂ Cyclohexane (27, 127, 136)			
0	27.55		80.75
10	47.05		
20	76.9		
30	121.3		
40	181.6		
50	269.2		
60	385.0		
70	540.8		
80	741.3		
90	992		
100	1 304		
C₆H₁₂O₂ Caproic acid (53)			
80	2.5		
90	5.3		
100	10.6		
110	18.9		
120	31.4		
130	51.0		
135	62.6		
C₆H₁₂O₂ Isocaproic acid (53, 54)			
70	1.9		198.6
80	4.0	t , °C	p_{mm}
100	13.9	160	204.2
120	39.2	170	290.4
140	94.4	180	407.4
150	141.0	190	564.9
C₆H₁₂O₂ Amyl formate, 760 mm at 123.25° (135)			
C₆H₁₂O₂ Isoamyl formate (64)			
50	49		123.5
60	79		
70	121		
80	180		
90	258		
100	360		
110	493		
120	679		
C₆H₁₂O₂ Ethyl butyrate (64)			
45 to 121	39 318	8.093	121.0
C₆H₁₂O₂ Isobutyl acetate, 25 to 115° (138)			
C₆H₁₂O₂ Propyl propionate (64)			
45 to 125	39 221	8.0525	123.0
C₆H₁₄ Diisopropyl (136)			
-10	44.7		57.95
0	76.0	t , °C	p_{mm}
+10	123.5	50	584.8
20	190.5	60	807
30	285.1	70	1 093
40	411.6	80	1 444

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C₆H₁₄ Hexane (30, 72, 132, 136)			
-83 to -50	36 702	8.782	68.95
-50 to -10	35 162.7	8.399	
-10 to +90	31 679	7.724	
C₆H₁₄O Methylisobutyl carbinol, 760 mm at 131.82° (16)			
C₆H₁₄O Dipropyl ether (14)			
8 to 90	34 295	7.821	89.5
C₆H₁₅B Boron triethyl (117)			
0	12.5		
20	39.8		
40	104.7		
60	236.6		
70	331.9		
80	455.0		
C₇H₄Cl₂O <i>o</i>-Chlorobenzoyl chloride (49)			
100 to 122	52 742	8.396	
C₇H₄Cl₂O <i>m</i>-Chlorobenzoyl chloride (49)			
94 to 117	49 870	8.086	
C₇H₄Cl₂O <i>p</i>-Chlorobenzoyl chloride (49)			
97 to 120	53 848	8.619	
C₇H₅ClO Benzoyl chloride (49, 54)			
140 to 200	45 416	7.9245	197.3
40	1.1	t , °C	p_{mm}
50	2.4	100	33.9
60	4.8	110	51.4
70	8.2	120	75.1
80	13.6	130	107.8
90	21.8	140	152.0
C₇H₅ClO₂ <i>o</i>-Chlorobenzoic acid, 0.298 mm at 100° (103)			
<i>m</i>-Chlorobenzoic acid, 0.333 mm at 100° (103)			
<i>p</i>-Chlorobenzoic acid, 0.94 mm at 100° (103)			
C₇H₅N Benzonitrile (54, 126)			
60	6.3		191.30
70	10.5	t , °C	p_{mm}
80	17.0	150	254.7
90	27.2	160	338.8
100	42.7	170	445.7
110	65.0	180	582.1
120	94.2	190	748.2
130	135.5		
140	187.3		
C₇H₅NO Phenyl isocyanate (20)			
75	36.3		
80	45.3		
85	55.9		
90	68.2		
95	83.9		
C₇H₅NO₃ <i>o</i>-Nitrobenzaldehyde, 0.0188 mm at 100° (102)			
<i>m</i>-Nitrobenzaldehyde, 0.0132 mm at 100° (102)			
<i>p</i>-Nitrobenzaldehyde, 0.0090 mm at 100° (102)			
C₇H₅NO₄ <i>o</i>-Nitrobenzoic acid, 0.0605 mm at 100° (103)			
<i>m</i>-Nitrobenzoic acid, 0.0212 mm at 100° (103)			
<i>p</i>-Nitrobenzoic acid, 0.0059 mm at 100° (103)			
C₇H₅N₃O₆ Trinitrotoluene (66)			
80	0.042		
85	0.053		
90	0.067		
95	0.085		
100	0.106		

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C₇H₆O Benzaldehyde (54)			
30	1.1		178.3
40	2.3	<i>t</i> , °C	<i>p</i> _{mm}
50	5.0	120	132
60	8.9	130	188
70	15.3	140	263
80	27.7	150	353
90	39.8	160	469
100	60.5	170	614
110	90.7	180	790
C₇H₆O₂ Benzoic acid (54, 103)			
100	1.79 (Steam distillation)		249
140	14.6	<i>t</i> , °C	<i>p</i> _{mm}
150	23.6	210	239
160	36.3	220	331.5
170	55.8	230	451
180	81.6	240	597
190	119.1	250	780
200	171.3		
C₇H₆O₃ <i>o</i>-Hydroxybenzoic acid, 0.862 mm at 100° (103)			
<i>m</i>-Hydroxybenzoic acid, 0.257 mm at 100° (103)			
<i>p</i>-Hydroxybenzoic acid, 0.025 mm at 100° (103)			
C₇H₇NO₂ <i>o</i>-Nitrotoluene (11.5); cf. (54)			
50 to 225	48 114	7.9728	220.38
C₇H₇NO₂ <i>m</i>-Nitrotoluene (11.5)			
55 to 235	50 128	8.0655	231.87
C₇H₇NO₂ <i>p</i>-Nitrotoluene (11.5); cf. (54)			
80 to 240	49 950	7.9815	238.34
C₇H₈ Toluene (4, 28, 91, 126); cf. (54)			
-92 to +15	39 198	8.330	110.70
30	36.7	<i>t</i> , °C	<i>p</i> _{mm}
40	59.1	80	289.7
50	92.6	90	404.6
60	139.5	100	557.2
70	202.4		
C₇H₈O Benzyl alcohol (54)			
100 to 135	59 491	9.5152	203.9
135 to 205	53 118	8.6977	
61	1		
80	4.7		
90	8.7		
C₇H₈O <i>o</i>-Cresol (33); cf. (54)			
50	1.87		190.5
60	3.55	<i>t</i> , °C	<i>p</i> _{mm}
70	6.5	130	109.4
80	11.5	140	158.1
90	19.4	150	222.9
100	31.6	160	308.3
110	49.2	170	421.2
120	74.1	180	566.9
C₇H₈O <i>m</i>-Cresol (33); cf. (54)			
60	1.76		202.2
70	3.4	<i>t</i> , °C	<i>p</i> _{mm}
80	6.37	140	106.9
90	11.3	150	154.2
100	19.05	160	219.3
110	31.0	170	302.7
120	48.6	180	411.2
130	72.5	190	549.6

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C₇H₈O <i>p</i>-Cresol (33); cf. (54)			
60	1.7		202.1
70	3.3	<i>t</i> , °C	<i>p</i> _{mm}
80	6.17	140	105.0
90	10.8	150	152.1
100	18.3	160	216.8
110	30.1	170	300.0
120	47.4	180	407.4
130	71.0	190	548.3
C₇H₈O Anisole, 760 mm at 153.80° (126)			
C₇H₉N Methylaniline (74); cf. (54)			
40	1.0		195.70
50	2.5	<i>t</i> , °C	<i>p</i> _{mm}
60	4.4	140	147.6
70	7.5	150	207.1
80	12.1	160	286.0
90	19.6	170	380.9
100	31.5	180	502.6
110	49.3	190	654.5
120	72.8	200	843.5
130	104.0		
C₇H₉N <i>o</i>-Toluidine (11.5); cf. (54)			
40	1.1		199.84
50	2.1	<i>t</i> , °C	<i>p</i> _{mm}
60	3.7	140	129.9
70	6.4	150	180.5
80	10.5	160	250.2
90	17.3	170	338.0
100	27.2	180	450.2
110	41.7	190	590.7
120	62.3	200	762.9
130	91.2	205	863.9
C₇H₉N <i>m</i>-Toluidine (11.5); cf. (54)			
45	1.3		202.86
50	1.9	<i>t</i> , °C	<i>p</i> _{mm}
60	3.4	150	162.6
70	5.7	160	224.9
80	9.4	170	305.9
90	15.2	180	410.6
100	23.9	190	541.9
110	36.7	200	706.7
120	54.8	205	803.4
130	80.4		
140	115.5		
C₇H₉N <i>p</i>-Toluidine (11.5); cf. (54)			
40	1.1		200.35
50	2.0	<i>t</i> , °C	<i>p</i> _{mm}
60	3.7	150	177.2
70	6.3	160	244.0
80	10.5	170	330.6
90	16.9	180	441.3
100	26.6	190	580.4
110	40.6	200	753.0
120	60.6	205	854.2
130	88.4		
140	126.3		
C₇H₁₄ Methylcyclohexane, 760 mm at 101.20° (127)			

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
$\text{C}_7\text{H}_{14}\text{O}_2$ Heptylic acid (53, 54)			
90	1.9		221.0
100	4.1	t , °C	p_{mm}
120	15.1	190	288.4
140	42.3	200	400.9
160	97.5	210	549.6
170	141.7	220	741.3
180	204.2		

$\text{C}_7\text{H}_{14}\text{O}_2$ Isopropyl isobutyrate (135)			
10	6.5		120.75
20	11.9		
40	35.0		
60	89.0		
80	201.1		
100	406.0		
120	743.9		
140	1 290		

C_7H_{16} Heptane (72, 136)			
-63 to -40	37 358	8.2585	98.42
0	11.45	t , °C	p_{mm}
+10	20.5	80	426.6
20	35.5	90	588.8
30	58.35	100	795.2
40	92.05	110	1 047
50	140.9	120	1 367
60	208.9		
70	302.3		

$\text{C}_8\text{H}_4\text{O}_3$ Phthalic anhydride (56, 57, 70); cf. (86)			
160 to 285	54 920	8.022	284.6

$\text{C}_8\text{H}_8\text{ClNO}$ <i>o</i> -Chloroacetanilide, 0.94 mm at 100° (104)			
<i>m</i> -Chloroacetanilide, 0.078 mm at 100° (104)			
<i>p</i> -Chloroacetanilide, 0.92 mm at 100° (104)			

$\text{C}_8\text{H}_8\text{N}_2\text{O}_3$ <i>o</i> -Nitroacetanilide, 0.12 mm at 100° (104)			
<i>m</i> -Nitroacetanilide, 0.007 mm at 100° (104)			
<i>p</i> -Nitroacetanilide, 0.008 mm at 100° (104)			

$\text{C}_8\text{H}_8\text{O}$ Acetophenone (10, 39, 54)			
30 to 100	55 117	9.1352	198.5
100 to 194	49 141	8.3170	(at 715 mm)

$\text{C}_8\text{H}_8\text{O}_2$ Phenylacetic acid, 0.541 mm at 100° (103)			
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$\text{C}_8\text{H}_8\text{O}_2$ Methyl benzoate (54)			
60	3.9		197.5
70	6.8	t , °C	p_{mm}
80	11.5	140	136.2
90	18.6	150	190.5
100	29.2	160	260.9
110	45.0	170	351.6
120	66.7	180	472.1
130	96.3	190	625.9

$\text{C}_8\text{H}_8\text{O}_3$ 3-Hydroxytoluene-2-carboxylic acid, 0.982 mm at 100° (103)			
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3-Hydroxytoluene-4-carboxylic acid, 0.507 mm at 100° (103)			
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4-Hydroxytoluene-3-carboxylic acid, 0.462 mm at 100° (103)			
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5-Hydroxytoluene-3-carboxylic acid, 0.151 mm at 100° (103)			
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4-Hydroxytoluene-2-carboxylic acid, 0.0073 mm at 100° (103)			
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Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
$\text{C}_8\text{H}_8\text{O}_3$ Methyl salicylate (84)			
175 to 215	48 670	8.008	222.89
216	645.5		
218	677.2		
220	710.2		
222	744.3		
224	779.8		
225	798.1		

$\text{C}_8\text{H}_9\text{FO}$ <i>p</i> -Fluorophenetole, 762 mm at 172.70° (120)			
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C_8H_{10} Ethylbenzene (132)			
0	5.9		133.91
10	9.6	t , °C	p_{mm}
20	15.3	90	223.1
30	23.75	100	307.0
40	36.1	110	414.15
50	53.8	120	545.9
60	78.65	130	695.95
70	113.0		
80	160.0		

C_8H_{10} <i>o</i> -Xylene (132)			
0	4.0		143.61
10	6.4	t , °C	p_{mm}
20	10.05	90	153.5
30	15.55	100	213.1
40	23.7	110	291.7
50	35.5	120	393.85
60	52.4	130	524.6
70	76.15	140	689.9
80	108.9		

C_8H_{10} <i>m</i> -Xylene (127, 132)			
0	1.75		139.00
10	3.45	t , °C	p_{mm}
20	6.43	90	168.05
30	11.43	100	238.22
40	19.48	110	330.33
50	31.94	120	448.85
60	50.59	130	598.59
70	77.62	140	784.64
80	115.72		

C_8H_{10} <i>p</i> -Xylene (127, 132)			
0	8.29		138.30
10	11.52	t , °C	p_{mm}
20	16.35	90	197.48
30	23.52	100	270.46
40	34.00	110	364.23
50	49.22	120	481.33
60	70.64	130	624.93
70	100.76	140	794.84
80	142.04		

$\text{C}_8\text{H}_{10}\text{O}$ Phenetole, 760 mm at 172.00° (119)			
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$\text{C}_8\text{H}_{11}\text{N}$ Dimethylaniline (74); cf. (54)			
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40	2.5		193.50
50	4.1	t , °C	p_{mm}
60	6.8	140	163.9
70	10.0	150	227.1
80	15.4	160	307.0
90	24.3	170	408.1
100	37.9	180	536.0
110	56.8	190	695.4
120	81.8	195	787.5
130	116.2		

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C ₈ H ₁₁ N Ethylaniline (74); cf. (54)			
40	1.1		204.72
50	2.4	<i>t</i> , °C	<i>p</i> _{mm}
60	4.0	150	158.0
70	6.1	160	218.8
80	10.0	170	296.0
90	16.0	180	394.2
100	24.0	190	518.0
110	36.4	200	674.4
120	54.5	210	867.0
130	79.0		
140	112.0		

C ₈ H ₁₆ O ₂ <i>n</i> -Caprylic acid (53)			
95	0.8		
100	1.6		
110	3.8		
120	7.6		
130	14.2		
140	24.3		
150	39.0		
160	61.0		

C ₈ H ₁₈ 2, 5-Dimethylhexane (124, 136)			
10	13.0		108.53
20	23.0		
30	38.5		
40	61.8		
50	95.9		
70	213.3		
90	426.6		
100	578.8		
120	1 020		
130	1 319		

C ₈ H ₁₈ <i>n</i> -Octane (72, 132, 136)			
-35	0.17		125.8
-30	0.28	<i>t</i> , °C	<i>p</i> _{mm}
-20	0.64	80	174.8
-10	1.39	90	253.4
0	2.94	100	353.6
+10	5.62	110	481.9
20	10.45	120	646.4
30	18.40	130	859
40	30.85	140	1 114
50	49.35	150	1 425
60	77.55		
70	117.9		

C ₉ H ₇ N Quinoline (133)			
180 to 240	49 720	7.969	237.2
80	3.1		
90	5.2		
100	8.5		
110	13.4		
120	20.7		
130	31.0		
140	45.3		
150	65.3		
160	91.4		
170	127.0		

C ₉ H ₁₀ O ₂ Hydratropic acid, 0.293 mm at 100° (103)			
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Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C ₉ H ₁₂ Cumene (132)			
0	6.45		154.73
10	8.65	<i>t</i> , °C	<i>p</i> _{mm}
20	11.8	90	124.45
30	16.45	100	170.5
40	23.05	110	230.95
50	32.5	120	309.0
60	45.8	130	407.55
70	64.35	140	530.1
80	89.9	150	679.7

C ₉ H ₁₂ <i>n</i> -Propylbenzene (132)			
0	6.25		156.28
10	7.7	<i>t</i> , °C	<i>p</i> _{mm}
20	10.0	90	110.05
30	13.55	100	154.4
40	18.8	110	213.6
50	26.6	120	291.0
60	38.0	130	389.6
70	54.4	140	511.9
80	77.65	150	659.1

C ₉ H ₁₂ Pseudocumene (132)			
0	5.9		169.33
10	7.0	<i>t</i> , °C	<i>p</i> _{mm}
20	8.7	100	105.95
30	11.3	110	145.8
40	15.05	120	198.55
50	20.5	130	267.6
60	28.3	140	355.9
70	39.4	150	466.8
80	54.9	160	603.9
90	76.45		

C ₉ H ₁₂ Mesitylene (132)			
0	15.6		161.94
10	20.45	<i>t</i> , °C	<i>p</i> _{mm}
20	27.15	100	247.25
30	36.4	110	309.55
40	48.9	120	381.1
50	65.55	130	461.7
60	87.35	140	550.05
70	115.45	150	643.55
80	150.8	160	740.35
90	194.45		

C ₉ H ₁₃ N Dimethyl- <i>o</i> -toluidine (54)			
105 to 185	45 260	8.043	184.8
60	7.0		
70	12.3		
80	20.2		
90	32.1		
100	49.4		

C ₉ H ₁₃ N Dimethyl- <i>p</i> -toluidine (54)			
135 to 211	48 502	8.124	210.0
80	6.9		
90	12.0		
100	19.5		
110	30.8		
120	46.6		
130	68.55		

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C₉H₁₈O₂ Pelargonic acid (53)			
100	0.3	t , °C	p_{mm}
110	1.2	150	20.5
120	3.0	160	32.5
130	6.3	170	51.5
140	12.2		
C₉H₁₈O₂ Isobutyl valerate (64)			
90 to 170	44 482	8.143	168.4
C₁₀H₇Br α-Bromonaphthalene (54, 84)			
110	3.55		281.1
120	5.55	t , °C	p_{mm}
130	8.5	230	232.6
140	12.8	240	300.3
150	18.9	250	381.5
160	27.4	260	482.0
180	54.95	270	604.0
200	102.4	280	743.0
220	178.7		
C₁₀H₇Cl α-Chloronaphthalene (54)			
100	3.8		259.3
110	6.5	t , °C	p_{mm}
120	10.5	200	178.2
130	16.3	220	304.8
140	24.5	230	390.4
150	35.7	240	497.7
160	51.05	250	622.0
180	98.5		
C₁₀H₈ Naphthalene (9, 23, 51, 71, 73, 108, 111)			
120 to 200	47 362	7.927	218.0
85	9.8	t , °C	p_{mm}
90	12.5	235	1 098
100	18.9	240	1 218
110	28.3	245	1 347
225	887	250	1 487
230	988		
C₁₀H₈O α-Naphthol (11.5)			
110	1.7		288.01
120	2.8	t , °C	p_{mm}
130	4.6	220	139.0
140	7.4	230	185.2
150	11.5	240	243.2
160	17.9	250	315.4
170	25.8	260	403.7
180	37.5	270	511.3
190	53.5	280	639.6
200	74.7	290	797.3
210	02.9	295	879.1
C₁₀H₈O β-Naphthol (11.5)			
130	3.6		294.85
140	5.8	t , °C	p_{mm}
150	9.0	230	149.8
160	13.6	240	198.5
170	20.2	250	259.9
180	29.5	260	336.2
190	42.1	270	430.0
200	59.2	280	544.3
210	81.9	290	685.1
220	111.5	300	848.7
C₁₀H₁₂ Tetrahydronaphthalene (46)			
100	26.3	t , °C	p_{mm}
140	118	200	646
160	219	207	753

Range, °C (or t , °C)	A, joule (or p_{mm})	B (for p in mm)	Normal B. P., °C
C₁₀H₁₄ Cymene (132)			
0	4.65		174.98
10	5.2	t , °C	p_{mm}
20	6.3	100	87.85
30	8.15	110	122.85
40	10.95	120	169.25
50	15.15	130	229.45
60	21.4	140	304.65
70	30.45	150	398.0
80	43.55	160	519.6
90	62.1	170	672.7
C₁₀H₁₄ Isobutylbenzene (132)			
0	2.55		167.41
10	3.65	t , °C	p_{mm}
20	5.3	100	104.5
30	7.75	110	145.7
40	11.4	120	200.35
50	16.8	130	271.85
60	24.6	140	363.2
70	35.85	150	478.3
80	51.75	160	627.1
90	74.0		
C₁₀H₁₅N Diethylaniline (74); cf. (54)			
50	1.6		216.27
60	2.7	t , °C	p_{mm}
70	4.2	150	113.5
80	6.8	160	158.0
90	10.0	170	216.0
100	16.2	180	291.7
110	25.1	190	386.9
120	38.2	200	504.0
130	56.2	210	651.0
140	80.6	220	837.0
C₁₀H₁₆O Camphor (83, 110)			
180	380		208.25
190	490		
200	624		
C₁₀H₁₈ Decahydronaphthalene (46)			
100	49.5	t , °C	p_{mm}
130	140	170	459
150	261		
C₁₀H₂₀O₂ Capric acid (53)			
120	0.5	t , °C	p_{mm}
130	1.9	170	25.4
140	4.5	180	40.2
150	8.8	190	62.9
160	15.4		
C₁₀H₂₂ 2, 6-Dimethyloctane (136)			
0	0.6		158.6
15	1.9	t , °C	p_{mm}
30	5.0	90	87.3
45	11.7	105	150.1
60	24.7	120	247.0
75	48.0	140	453.2
C₁₂H₉N Carbazole (71, 99)			
244 to 352	64 715	8.280	354.76
250	65.0	t , °C	p_{mm}
260	87.9	290	191.2
270	115.7	300	242.0
280	149.7	310	303.8

Range, °C (or <i>t</i> , °C)	A, joule (or <i>p</i> _{mm})	B (for <i>p</i> in mm)	Normal B. P., °C
C₁₂H₉N Carbazole.—(Continued)			
320	378.5	<i>t</i> , °C	<i>p</i> _{mm}
330	467.7	350	695.8
340	573.0		
C₁₂H₁₀ Acenaphthene (71)			
147 to 288	54 279	8.033	277.0
C₁₂H₁₀ Diphenyl (51)			
210	243		255
220	330	<i>t</i> , °C	<i>p</i> _{mm}
225	376.5	240	542.9
230	426.6	245	609.5
235	482	250	681.6
C₁₂H₁₀AsCl Diphenylarsine chloride (5)			
25 to 75	62 952	7.8930	
C₁₂H₁₀O Phenyl ether (14.5)			
153.0	42.6		259
158.0	51.8	<i>t</i> , °C	<i>p</i> _{mm}
165.0	66.8	168.0	73.3
C₁₂H₁₁N Diphenylamine (43)			
278 to 284	57 350	8.088	
286	544	<i>t</i> , °C	<i>p</i> _{mm}
287	565	288	600
C₁₂H₂₄O₂ Lauric acid (40, 88)			
164 to 205	74 386	9.768	
100	0.058		
C₁₃H₁₀ Fluorene (71)			
161 to 300	56 615	8.059	297.9
C₁₃H₁₀O Benzophenone (51)			
260 to 308	58 221	8.137	305.4
C₁₃H₁₂ Diphenylmethane (24)			
217 to 283	52 360	7.967	264.5
C₁₄H₈O₂ Anthraquinone (73); cf. (110)			
285 to 370	63 985	8.002	379.8
380	763.4		
C₁₄H₁₀ Anthracene (71, 73); cf. (75)			
100 to 160	72 000	8.91	342
223 to 342	59 219	7.910	
C₁₄H₁₀ Phenanthrene (71, 73)			
203 to 347	57 247	7.771	338.4
C₁₄H₂₈O₂ Myristic acid (40, 88)			
190 to 224	75 783	9.541	
100	0.033		
C₁₅H₁₄O Dibenzyl ketone (134)			
285 to 325	62 118	8.257	330.6
280	245.2	<i>t</i> , °C	<i>p</i> _{mm}
285	277.5	310	495.2
290	313.3	315	551.8
295	352.7	320	613.2
300	396.0	325	679.9
305	443.3	330	752.0

LITERATURE

(For a key to the periodicals see end of volume)

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VAPOR PRESSURES AND ORTHOBARIC DENSITIES ABOVE ONE ATMOSPHERE

C. S. CRAGOE

The available data on the compounds in this section are expressed within the experimental errors by an equation which may be written in either of the following forms:

$$\log_{10} p = \frac{T - T_B}{T} \left[A - B \left(\frac{T - T_B}{T_B} \right) + C \left(\frac{T - T_B}{T_B} \right)^2 \right]$$

$$\log_{10} p = (A + 2B + 3C) - \frac{T_B}{T} (A + B + C) - \frac{T}{T_B} (B + 3C) + \frac{CT^2}{T_B^2}$$

where p is the vapor pressure in normal atmospheres, T the temperature and T_B the normal boiling point in °K, and A , B and C are constants.

The latent heat of vaporization in joules per g at $T^\circ\text{K}$ is given by

$$l = 0.2333p \frac{T_B}{T} \left(\frac{1}{d_v} - \frac{1}{d_l} \right) \left[A - B \left(\frac{T - T_B}{T_B} \right) \left(\frac{T + T_B}{T_B} \right) + C \left(\frac{T - T_B}{T_B} \right)^2 \left(\frac{2T + T_B}{T_B} \right) \right]$$

$t = ^\circ\text{C}$; d_l (resp. d_v) = density of saturated liquid (resp. vapor) in g/cm³; $d_m = \frac{1}{2}(d_l + d_v)$. Critical-point values are in bold-face type. T_c = Critical temperature, °K.

The literature references are arranged in the order of their relative importance.

B-TABLE, STANDARD ARRANGEMENT

H₂O, *v. p.* 233

HCl Hydrogen Chloride (p), (79, 46, 53, 57, 58, 51, 104, 107, 163, 164, 21, 96, 98, 55, 179, 180, 50, 7, 8, 61, 62); (d) (107, 145, 163, 164, 7, 8, 156)

$t, ^\circ\text{C}$	$p, \text{atm.}$	g/cm^3	
		d_l	d_v
-85.03	1.00	1.191	0.0025
-80	1.32	1.178	.0032
-70	2.19	1.151	.0052
-60	3.45	1.122	.0083
-50	5.20	1.093	.012
-40	7.55	1.063	.017
-30	10.62	1.031	.023
-20	14.53	0.997	.032
-10	19.43	.962	.042
0	25.46	.924	.054
+10	32.78	.881	.072
20	41.58	.831	.097
30	52.08	.772	.130
40	64.52	.697	.180
50	79.19	.592	.260
51.5	81.6	0.424	
T_B	A	B	C
188.07	4.630	0.48	0.50

$$d_m = 0.424 \left[1 + 0.97 \left(1 - \frac{T}{T_c} \right) \right]$$

HBr Hydrogen Bromide (p) (114, 53, 104, 57, 58, 162, 163, 164, 107, 96, 55); (d) (156, 163, 164, 56)

t	p	t	p
-67.0	1.00	0	12.3
-60	1.41	+10	16.0
-50	2.20	20	20.6
-40	3.31	30	26.1
-30	4.79	40	32.5
-20	6.72	50	40.2
-10	9.19	60	49.0

HBr.—(Continued)

t	p	t	d_l
70	59.4	-67	2.152
80	71.4	+10	1.630
90	85	20	1.589
T_B	A	B	C
206.1	4.540	0.48	0.50

HI Hydrogen Iodide (p) (104, 53, 57, 58, 107, 163, 164, 162, 96, 55, 61, 62); (d) (156, 107, 163, 164, 19)

t	p	t	p
-35.5	1.00	80	25.8
-30	1.26	90	31.0
-20	1.86	100	37.0
-10	2.66	110	43.9
0	3.70	120	51.6
+10	5.01	130	60.4
20	6.65	140	70.4
30	8.65	150.5	82
40	11.1	t	d_l
50	13.9	-35.5	2.798
60	17.3	+12	2.270
70	21.2	20	2.230
T_B	A	B	C
237.6	4.430	0.48	0.50

SO₂ Sulfur Dioxide, *v. p.* 236

SO₃ Sulfur Trioxide (p) (17, 18, 99, 151, 154, 155); (d) (17, 18, 99, 88, 151, 115)

t	p	d_l	d_v
44.6	1.00	1.807	0.003
60	2.0	1.732	.006
80	4.3	1.639	.013
100	8.0	1.547	.025
110	10.4	1.506	.031
120	13.3	1.465	.037
130	16.7	1.424	.045
140	20.6	1.382	.056
150	25.1	1.340	.069
160	30.3	1.296	.086
170	36.4	1.249	.107
180	43.4	1.196	.137
190	51.5	1.134	.177
200	61.1	1.058	.233
210	72.5	0.960	.313
218.3	83.6	0.630	
T_B	A	B	C
317.7	6.860	5.50	5.30

$$d_m = 0.630 \left[1 + 0.60 \left(1 - \frac{T}{T_c} \right) + 1.8 \left(1 - \frac{T}{T_c} \right)^2 \right]$$

H₂S Hydrogen Sulfide (p) (41, 42, 147, 148, 125, 104, 57, 58, 162, 163, 164, 107, 96, 98, 50, 143); (d) (163, 164, 107, 19)

t	p	t	p
-59.5	1.00	-20	5.39
-50	1.60	-10	7.53
-40	2.50	0	10.2
-30	3.74	+10	13.6

H₂S.—(Continued)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
20	17.7	80	62.6
30	22.6	90	74.5
40	28.3	100.4	88.9
50	35.1	<i>t</i>	<i>d_l</i>
60	43.0	−59.5	0.965
70	52.1	+18.5	.91
<i>T_B</i>	A	B	C
213.6	4.820	0.83	0.63

H₂Se Hydrogen Selenide (*p*) (25, 64, 65, 125); (*d*) (64, 65)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
−41.2	1.00	40	15
−40	1.06	60	23
−30	1.64	80	34
−20	2.45	100	48
−10	3.54	120	67
0	4.9	138	88
+10	6.7	<i>t</i>	<i>d_l</i>
20	8.9	−41.2	2.12
30	11.6		
<i>T_B</i>	A	B	C
231.9	4.725	0.83	0.63

NO Nitric Oxide (69, 78, 1, 173, 96, 121)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
−151.0	1.0	−120	14.3
−150	1.1	−110	27
−140	3.0	−100	46
−130	7.0	− 93	65
<i>T_B</i>	A	B	C
122.1	5.780	0.30	0.00

N₂O Nitrous Oxide (*p*) (15, 42, 71, 175, 177, 174, 91, 92, 141, 84, 132, 133, 29, 82, 34, 50, 143, 185, 61, 62); (*d*) (70, 175, 35, 3, 4)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
−89.5	1.00	1.226	0.0031
−80	1.70	1.199	.0050
−70	2.81	1.170	.0080
−60	4.40	1.140	.0122
−50	6.6	1.108	.018
−40	9.5	1.075	.025
−30	13.3	1.040	.035
−20	18.1	1.001	.048
−10	24.0	0.958	.066
0	31.3	.910	.087
+10	40.0	.856	.115
20	50.3	.784	.161
30	62.6	.679	.240
36.5	71.7	0.451	
<i>T_B</i>	A	B	C
183.6	4.725	0.57	0.48

$$d_m = 0.451 \left[1 + 0.89 \left(1 - \frac{T}{T_c} \right) \right].$$

N₂O₄ Nitrogen Peroxide (14, 72, 142, 149, 150)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
21.3	1.00	60	5.03
30	1.48	70	7.26
40	2.28	80	10.3
50	3.42	90	14.4

N₂O₄.—(Continued)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
100	19.8	140	62.2
110	26.8	150	80.7
120	35.9	158	99
130	47.5		
<i>T_B</i>	A	B	C
294.4	5.945	−0.74	0.00

Partial dissociation in vapor phase (N₂O₄ → 2NO₂).**NH₃** Ammonia, *v. p.* 234**N₂H₄** Hydrazine (100, 101)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
113.5	1.0	250	26
140	2.3	300	56
170	5	350	104
200	10	380	145
<i>T_B</i>	A	B	C
386.6	5.720	1.00	0.56

NOCl Nitrosyl Chloride (22, 172)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
−5.7	1.00	1.364	0.003
0	1.27	1.350	.004
+10	1.86	1.325	.006
20	2.67	1.300	.008
30	3.7	1.27	.010
40	5.1	1.24	.014
<i>T_B</i>	A	B	C
267.4	4.900	0.50	0.50

PH₃ Phosphine (*p*) (79, 21, 97, 98, 107, 163, 164, 122, 161); (*d*) (161, 163, 164, 107, 19)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
−87.5	1.00	0.746	0.0023
−80	1.46	.738	.0032
−70	2.30	.725	.0050
−60	3.47	.712	.0073
−50	5.0	.698	.010
−40	7.1	.684	.014
−30	9.7	.668	.019
−20	12.9	.651	.025
−10	16.8	.633	.033
0	21.6	.613	.042
+10	27.4	.591	.053
20	34.2	.566	.067
30	42.3	.537	.086
40	51.9	.50	.11
51	64	0.30	
<i>T_B</i>	A	B	C
185.6	4.225	0.35	0.48

$$d_m = 0.30 \left[1 + 0.58 \left(1 - \frac{T}{T_c} \right) \right].$$

PF₃ Phosphorus Trifluoride (111, 112)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
−95	1.0	−40	15
−80	2.4	−20	30
−60	7	−10	40
<i>T_B</i>	A	B	C
178.1	4.970	0.00	0.00

PF₅ Phosphorus Pentafluoride (110, 112)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
-75	1.0	0	28
-60	2.4	+10	38
-30	9	16	46
<i>T_B</i>	A	B	C
198.1	5.280	0.00	0.00

PH₄Cl Phosphonium Chloride (21, 161, 169)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
28.5*	48	40	61
30	50	45	68
35	55	49	73
<i>T_B</i>	A	B	C
188.1	4.480	0.00	0.00

* Triple point. (Partial decomposition in vapor phase, PH₄Cl → PH₃ + HCl).

PSF₃ Phosphorus Sulfofluoride (171)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
-10	4.6	+10	9.4
0	6.7	20	12.8
<i>T_B</i>	A	B	C
228.1	5.000	0.00	0.00

AsH₃ Arsine (61, 62, 118)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
-55	1.00	-10	6.1
-40	2.0	0	8.4
-30	3.0	+10	11
-20	4.3	20	15
<i>T_B</i>	A	B	C
218.1	4.650	0.35	0.48

CO Carbon Monoxide (*p*) (39, 40, 56, 9, 120, 189, 191); (*d*) (9, 39)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
-192.0	1.0	0.803	0.0044
-190	1.2	.794	.0054
-180	3.2	.748	.013
-170	6.7	.697	.027
-160	12.4	.639	.046
-150	20.9	.560	.088
-140	33.2	.420	.190
-139	35	0.303	
<i>T_B</i>	A	B	C
81.1	3.990	0.60	0.70

$$d_m = 0.303 \left[1 + 0.84 \left(1 - \frac{T}{T_c} \right) \right].$$

CO₂ Carbon Dioxide, v. p. 235

CH₄ Methane (*p*) (27, 87, 39, 38, 173, 96, 121, 190, 50, 82); (*d*) (27, 87, 39, 38, 13, 123)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
-161.5	1.00	0.4245	0.0018
-160	1.13	.4222	.0020
-150	2.35	.4075	.0039
-140	4.38	.3916	.0068
-130	7.45	.3742	.0112
-120	11.84	.3547	.0175
-110	17.83	.3324	.0269
-100	25.7	.3050	.0413
-90	35.9	.2668	.0665
-82.1	45.8	0.1615	

<i>T_B</i>	A	B	C
111.6	4.000	0.22	0.30

$$d_m = 0.1615 \left[1 + 0.77 \left(1 - \frac{T}{T_c} \right) \right].$$

C₂H₂ Acetylene (*p*) (43, 106, 92, 93, 176, 177, 5, 6, 96, 82, 31); (*d*) (105, 106, 108, 109, 5)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
-84.0*	1.00		
-81.5†	1.20	0.618	0.0021
-70	2.20	.601	.0036
-60	3.48	.585	.0056
-50	5.3	.568	.0085
-40	7.7	.551	.012
-30	10.9	.532	.017
-20	14.9	.512	.024
-10	20.0	.490	.033
0	26.3	.464	.045
+10	33.9	.435	.060
20	43.1	.400	.082
30	54.1	.346	.122
36.0	61.7	0.230	
<i>T_B</i>	A	B	C
188.1	4.675	0.48	0.50

$$d_m = 0.230 \left[1 + 0.915 \left(1 - \frac{T}{T_c} \right) \right].$$

* Normal sublimation point.

† Triple point.

C₂H₄ Ethylene (*p*) (79, 105, 28, 42, 177, 82, 173, 96, 188, 33, 32, 119, 127, 50, 183, 61, 62); (*d*) (103, 105, 96, 35, 36, 19)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
-103.8	1.00	0.569	0.0022
-100	1.24	.564	.0026
-90	2.10	.549	.0041
-80	3.35	.534	.0063
-70	5.07	.517	.0093
-60	7.38	.500	.0133
-50	10.4	.481	.019
-40	14.2	.461	.025
-30	18.9	.439	.034
-20	24.8	.414	.046
-10	31.9	.384	.062
0	40.6	.345	.088
+9.6	50.6	0.210	
<i>T_B</i>	A	B	C
169.3	4.330	0.59	0.70

$$d_m = 0.210 \left[1 + 0.90 \left(1 - \frac{T}{T_c} \right) \right].$$

C₂H₆ Ethane (*p*) (102, 138, 139, 28, 103, 45, 37, 94, 91, 126, 73, 124, 127, 96, 50); (*d*) (138, 105, 103, 91)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
-88.62	1.000	0.546	0.00206
-80	1.556	.535	.00311
-70	2.471	.522	.00478
-60	3.743	.509	.00707
-50	5.449	.496	.0101
-40	7.672	.482	.0141
-30	10.50	.468	.0193
-20	14.02	.453	.0260
-10	18.34	.435	.0348
0	23.56	.416	.0463
+10	29.83	.393	.0619

C₂H₆—(Continued)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
20	37.28	0.363	0.085
30	46.1	.30	.14
32.2	48.2	0.220	
<i>T_B</i>	A	B	C
184.48	4.325	0.45	0.52

$$d_m = 0.220 \left[1 + 0.43 \left(1 - \frac{T}{T_c} \right) + 0.48 \left(1 - \frac{T}{T_c} \right)^2 \right]$$

For other hydrocarbons, *v. p.* 244.**CH₃Cl** Methyl Chloride (*p*) (81, 80, 158, 12, 68, 128, 23, 47, 76, 90, 143, 178, 179); (*d*) (158, 81, 80, 47, 90, 181, 182)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
-24.0	1.00	0.997	0.00255
-20	1.18	.990	.00297
-10	1.74	.973	.00427
0	2.50	.955	.00599
+10	3.49	.937	.00820
20	4.75	.918	.0110
30	6.35	.898	.0145
40	8.33	.878	.0189
50	10.7	.856	.0242
60	13.6	.832	.032
70	17.1	.809	.039
80	21.2	.783	.049
90	25.9	.756	.060
100	31.4	.725	.075
110	37.8	.690	.094
120	45.0	.647	.120
130	53.2	.592	.159
140	62.6	.497	.238
143.2	65.8	0.365	
<i>T_B</i>	A	B	C
249.1	4.540	0.22	0.30

$$d_m = 0.365 \left[1 + 0.92 \left(1 - \frac{T}{T_c} \right) \right]$$

C₂H₅Cl Ethyl Chloride (*p*) (27, 86, 16, 146, 143, 135, 134, 179, 180, 52); (*d*) (27, 187, 59, 60, 195, 129, 140, 136)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
12.2	1.00	0.9060	0.00285
20	1.33	.8943	.00372
30	1.86	.8790	.00513
40	2.55	.8633	.00692
50	3.42	.8472	.00917
60	4.50	.8306	.0120
70	5.82	.8134	.0152
80	7.41	.7958	.0190
90	9.31	.7770	.0236
100	11.5	.7575	.0294
110	14.2	.737	.035
120	17.2	.715	.043
130	20.7	.691	.052
140	24.7	.665	.064
150	29.2	.636	.079
160	34.3	.602	.099
170	40.1	.559	.128
180	46.6	.494	.178
187	51.6	0.331	
<i>T_B</i>	A	B	C
285.3	4.615	0.48	0.50

$$d_m = 0.331 \left[1 + 1.006 \left(1 - \frac{T}{T_c} \right) - 0.064 \left(1 - \frac{T}{T_c} \right)^2 \right]$$

For other halogen substitution products of hydrocarbons, *v. p.* 245.**CS₂** Carbon Disulfide (*p*) (79, 167, 159, 160, 144, 10, 11, 66, 74, 192, 146, 143); (*d*) (89, 63, 157, 54, 10, 192, 136)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
46.25	1.00	1.225	
50	1.13	<i>t</i> , °C	
60	1.54	52.17	0.003559
70	2.05	53.53	.003709
80	2.69	57.08	.004064
90	3.47	59.95	.004452
100	4.42	64.24	.005000
110	5.55	66.96	.005376
120	6.90	70.10	.005797
130	8.47	75.55	.006658
140	10.3	78.82	.007288
150	12.4	85.03	.008361
160	14.9	99.24	.01167
170	17.6	130.48	.02166
180	20.8	159.10	.03484
190	24.3	171.52	.04185
200	28.3	183.48	.05846
210	32.8	193.05	.07309
220	37.8	209.32	.09907
230	43.4	217.35	.1163
240	49.6	229.46	.1420
250	56.5	262.8	.2570
260	64.1	271.6	.3215
270	72.5	273.0	.3679
273	75		
<i>T_B</i>	A	B	C
319.35	4.525	0.35	0.48

COS Carbon Oxsulfide (165, 77, 83)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
-50.2	1.0	40	18
-20	3	60	27
0	6	80	40
+20	11	105	61
<i>T_B</i>	A	B	C
222.9	4.465	0.65	0.70

C₂N₂ Cyanogen (*p*) (130, 170, 43, 48, 50, 61, 62, 26); (*d*) (61, 62)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
-21.17	1.000	70	18.7
-20	1.055	80	23.4
-10	1.626	90	28.9
0	2.414	100	35.3
+10	3.47	110	42.8
20	4.85	120	51.5
30	6.61	128.3	59.7
40	8.80	<i>t</i>	<i>d_l</i>
50	11.5	17	0.866
60	14.8		
<i>T_B</i>	A	B	C
251.93	5.010	0.94	0.90

HCN Hydrogen Cyanide (*p*) (131, 20, 75, 30); *cf.* (196); (*d*) (20, 19, 30, 67)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
25.65	1.00	0.695	0.0011
30	1.14	<i>t</i>	<i>p</i>
40	1.67	60	3.15
50	2.31		

HCN.—(Continued)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
70	4.20	120	14.5
80	5.52	130	18.0
90	7.16	140	22.1
100	9.16	150	27.0
110	11.6	<i>d_l</i>	<i>d_v</i>
160	32.7	0.420	0.050
170	39.3	.365	.077
180	47.1	.290	.120
183.5	50	0.20	
<i>T_B</i>	A	B	C
298.75	4.840	0.22	0.70

ClCN Cyanogen Chloride (143)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
12.7	1.00	50	3.58
20	1.32	60	4.80
30	1.88	70	6.33
40	2.62	80	8.22
<i>T_B</i>	A	B	C
285.8	4.800	0.00	0.00

For other C-compounds, *v. p.* 237.SiH₄ Silane (168, 2, 117)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
-112	1.00	-50	13
-100	1.9	-40	18
-90	3.0	-30	24
-80	4.6	-20	31
-70	6.7	-10	40
-60	9.5	-3.5	48
<i>T_B</i>	A	B	C
161.1	4.050	0.38	0.82

SiF₄ Silicon Tetrafluoride (61, 62, 113)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
-77*	2	-30	19
-70	3	-20	27
-60	5	-10	38
-50	8	-1.5	50
-40	13		
<i>T_B</i>	A	B	C
185.1	5.335	0.00	0.00

* Triple point.

GeCl₄ Germanium Tetrachloride (49, 116, 186)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
86.5	1.0	200	12
100	1.5	220	17
120	2.5	240	23
140	4.0	260	30
160	6.1	270	35
180	8.9	277	38
<i>T_B</i>	A	B	C
359.6	4.735	0.76	0.82

SnCl₄ Tin Tetrachloride (*p*) (24, 152, 184, 193, 194); (*d*) (153, 193, 194)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
114.1	1.00	1.978	0.0085
120	1.18	1.963	.0099
130	1.53	1.935	.0127
140	1.96	1.907	.0162

SnCl₄—(Continued)

<i>t</i>	<i>p</i>	<i>d_l</i>	<i>d_v</i>
150	2.48	1.878	0.0202
160	3.10	1.849	.0251
170	3.82	1.819	.0308
180	4.67	1.787	.0374
190	5.66	1.755	.0454
200	6.79	1.721	.0546
220	9.55	1.649	.0773
240	13.07	1.569	.108
260	17.48	1.476	.152
280	22.92	1.363	.216
300	29.56	1.21	.32
318.7	37.0	0.742	
<i>T_B</i>	A	B	C
387.2	4.710	0.76	0.82

$$d_m = 0.742 \left[1 + 0.98 \left(1 - \frac{T}{T_c} \right) \right]$$

BF₃ Boron Trifluoride (61, 62, 113)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
-101	1.00	-70	5.4
-90	2.0	-60	8.4
-80	3.4	-50	12
<i>T_B</i>	A	B	C
172.1	4.930	0.76	0.82

BCl₃ Boron Trichloride (137, 143, 166)

<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
12.4	1.00	50	3.2
20	1.3	60	4.2
30	1.8	70	5.4
40	2.4	80	6.8
<i>T_B</i>	A	B	C
285.5	4.480	0.76	0.82

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VAPOR PRESSURES AND ORTHOBARIC VOLUMES FOR H₂O, NH₃, CO₂ AND SO₂ ABOVE ONE ATMOSPHERE

F. G. KEYES

H₂O: VAPOR PRESSURES OF WATER IN ATM.

Reichsanstalt values corrected to I. C. T. temperature scale

t, °C	0	1	2	3	4	5	6	7	8	9
100	1.0000	1.0362	1.0735	1.1120	1.1514	1.1922	1.2341	1.2771	1.3216	1.3670
110	1.4139	1.4621	1.5115	1.5624	1.6148	1.6684	1.7236	1.7802	1.8384	1.8982
120	1.9594	2.0221	2.0869	2.1531	2.2208	2.2907	2.3620	2.4353	2.5103	2.5873
130	2.6660	2.7466	2.8295	2.9140	3.0010	3.0885	3.1794	3.2739	3.3693	3.4669
140	3.567	3.669	3.773	3.880	3.989	4.101	4.215	4.332	4.451	4.574
150	4.698	4.825	4.956	5.088	5.224	5.363	5.505	5.649	5.796	5.947
160	6.100	6.257	6.417	6.579	6.746	6.916	7.088	7.265	7.445	7.629
170	7.817	8.007	8.202	8.399	8.603	8.808	9.017	9.231	9.448	9.670
180	9.895	10.124	10.358	10.596	10.838	11.084	11.337	11.592	11.852	12.116
190	12.386	12.658	12.936	13.220	13.507	13.801	14.099	14.401	14.710	15.023
200	15.341	15.665	15.994	16.327	16.666	17.012	17.365	17.721	18.082	18.451
210	18.823	19.204	19.590	19.980	20.379	20.780	21.190	21.606	22.029	22.457
220	22.889	23.331	23.780	24.234	24.693	25.162	25.635	26.117	26.605	27.101
230	27.603	28.112	28.628	29.150	29.682	30.221	30.767	31.319	31.881	32.449
240	33.027	33.610	34.203	34.802	35.411	36.028	36.652	37.284	37.926	38.575
250	39.234	39.900	40.576	41.259	41.954	42.655	43.365	44.086	44.815	45.551
260	46.300	47.055	47.820	48.595	49.381	50.175	50.977	51.792	52.614	53.447
270	54.291	55.145	56.008	56.881	57.766	58.659	59.565	60.479	61.407	62.345
280	63.295	64.255	65.224	66.206	67.201	68.208	69.226	70.257	71.299	72.354
290	73.42	74.49	75.59	76.69	77.81	78.94	80.08	81.24	82.40	83.59
300	84.78	85.99	87.21	88.44	89.68	90.94	92.20	93.49	94.80	96.09
310	97.40	98.74	100.10	101.47	102.85	104.25	105.65	107.07	108.51	109.96
320	111.43	112.92	114.42	115.94	117.47	119.01	120.57	122.14	123.74	125.36
330	126.99	128.63	130.29	131.97	133.66	135.37	137.10	138.85	140.62	142.40
340	144.20	146.01	147.84	149.67	151.55	153.44	155.36	157.28	159.23	161.19
350	163.16	165.16	167.17	169.21	171.26	173.33	175.43	177.56	179.71	181.88
360	184.07	186.28	188.52	190.78	193.07	195.42	197.79	200.17	202.58	205.02
370	207.49	209.98	212.51	215.09	217.72 (crit.)					

SATURATED SPECIFIC VOLUMES

Liquid water (23, 40, 50)				Liquid water (23, 40, 50)				Water vapor (32)*				Water vapor (32)*			
<i>t</i> , °C	cm ³ /g	<i>t</i> , °C	cm ³ /g	<i>t</i> , °C	cm ³ /g	<i>t</i> , °C	cm ³ /g	<i>t</i> , °C	cm ³ /g	<i>t</i> , °C	cm ³ /g	<i>t</i> , °C	cm ³ /g	<i>t</i> , °C	cm ³ /g
100	1.0434	150	1.0881	200	1.1569	250	1.252	100	1677	125	768.9	150	392.4	175	217.2
110	1.0510	160	1.0997	210	1.1739	260	1.274	105	1420	130	667.1	155	346.6	180	194.9
120	1.0592	170	1.1124	220	1.1919	270	1.297	110	1208	135	581.0	160	307.1		
130	1.0680	180	1.1262	230	1.211			115	1034	140	508.0	165	272.8		
140	1.0776	190	1.1410	240	1.231			120	889.8	145	445.8	170	243.1		

* In view of the fact that the values (24) are obtained by calculation from vapor pressure and latent heat measurements, not as much consideration was given to them as to the direct measurements (32). The values given in the table are, however, in essential agreement with those (24); cf. also (5, 17, 38).

NH₃

VAPOR PRESSURE OF LIQUID AMMONIA, ATM. ± 0.05% (8, 10, 16, 19, 22, 28, 29, 30, 37, 39, 41, 48, 54)

From -78 to +70°

$$\log_{10}P = 27.376004 - \frac{1914.9569}{T} - 8.4598324 \log_{10}T + 2.39309 \times 10^{-3}T + 2.955214 \times 10^{-6}T^2$$

or

$$\log_{10}P = 9.584586 - \frac{1648.6068}{T} - 1.638646 \times 10^{-2}T + 2.403276 \times 10^{-5}T^2 - 1.168708 \times 10^{-8}T^3$$

From +50 to +132.9°

$$\log_{10}P = 2.050418 - \frac{T_c - T}{T} [2.9771 - 1.492414 \times 10^{-3}(T_c - T) + 1.36142 \times 10^{-5}(T_c - T)^2 - 5.47917 \times 10^{-8}(T_c - T)^3]$$

$$T_c = (132.9 + 273.1) = 406$$

<i>t</i> , °C	0	1	2	3	4	5	6	7	8	9
-70	0.1078	0.1001	0.0929	0.0861	0.0797	0.0738	0.0683	0.0631	0.0582	0.0537
-60	0.2161	0.2022	0.1891	0.1767	0.1651	0.1541	0.1437	0.1339	0.1246	0.1159
-50	0.4034	0.3800	0.3578	0.3367	0.3167	0.2977	0.2796	0.2624	0.2461	0.2307
-40	0.7083	0.6712	0.6357	0.6017	0.5693	0.5383	0.5087	0.4805	0.4536	0.4279
-30	1.1799	1.1236	1.0695	1.0175	0.9676	0.9197	0.8738	0.8297	0.7875	0.7471
-20	1.8774	1.7956	1.7166	1.6405	1.5671	1.4963	1.4281	1.3624	1.2992	1.2384
-10	2.8703	2.7555	2.6443	2.5368	2.4328	2.3322	2.2349	2.1408	2.0499	1.9621
- 0	4.2380	4.0818	3.9303	3.7832	3.6405	3.5020	3.3677	3.2375	3.1112	2.9888
+ 0	4.2380	4.3985	4.5640	4.7340	4.9090	5.0895	5.2750	5.4655	5.6610	5.8620
10	6.0685	6.2805	6.4985	6.7225	6.9520	7.1875	7.4290	7.6770	7.9310	8.1915
20	8.4585	8.7320	9.0125	9.3000	9.5940	9.8955	10.2040	10.5195	10.8430	11.1735
30	11.512	11.858	12.212	12.574	12.943	13.321	13.708	14.103	14.507	14.919
40	15.339	15.770	16.209	16.656	17.113	17.580	18.056	18.542	19.038	19.543
50	20.059	20.585	21.121	21.667	22.224	22.793	23.372	23.962	24.562	25.174
60	25.797	26.432	27.079	27.737	28.407	29.089	29.784	30.491	31.211	31.942
70	32.687	33.454	34.227	35.013	35.813	36.626	37.453	38.294	39.149	40.018
80	40.902	41.799	42.712	43.640	44.582	45.539	46.511	47.500	48.503	49.522
90	50.558	51.609	52.677	53.760	54.860	55.977	57.111	58.261	59.429	60.613
100	61.816	63.037	64.274	65.530	66.804	68.096	69.406	70.736	72.084	73.451
110	74.837	76.244	77.668	79.114	80.578	82.064	83.570	85.097	86.644	88.212
120	89.802	91.413	93.045	94.700	96.376	98.075	99.796	101.541	103.309	105.099
130	106.913	108.751	110.613							
132.9	112.3 (crit.)									

SPECIFIC VOLUME OF LIQUID AMMONIA UNDER SATURATION PRESSURE, CM³/G (7, 15, 18, 20, 27, 34)

$$V = \frac{4.2830 + 0.813055(133 - t)^{\frac{1}{2}} - 0.0082861(133 - t)}{1 + 0.424805(133 - t)^{\frac{1}{2}} + 0.015938(133 - t)}$$
; range, - 70 to 130°C

<i>t</i> , °C	0	1	2	3	4	5	6	7	8	9
-70	1.3788	1.3766	1.3745	1.3724	1.3702	1.3681	1.3660	1.3639	1.3618	1.3597
-60	1.4010	1.3988	1.3965	1.3942	1.3920	1.3898	1.3876	1.3854	1.3832	1.3810
-50	1.4245	1.4221	1.4197	1.4173	1.4150	1.4126	1.4103	1.4079	1.4056	1.4033
-40	1.4493	1.4468	1.4442	1.4417	1.4392	1.4367	1.4342	1.4318	1.4293	1.4269
-30	1.4757	1.4730	1.4703	1.4676	1.4649	1.4623	1.4597	1.4571	1.4545	1.4519
-20	1.5037	1.5008	1.4980	1.4951	1.4923	1.4895	1.4867	1.4839	1.4811	1.4784
-10	1.5338	1.5307	1.5276	1.5245	1.5215	1.5185	1.5155	1.5125	1.5096	1.5066
- 0	1.5660	1.5627	1.5594	1.5561	1.5528	1.5496	1.5464	1.5432	1.5400	1.5369
+ 0	1.5660	1.5694	1.5727	1.5761	1.5796	1.5831	1.5866	1.5901	1.5936	1.5972
10	1.6008	1.6045	1.6081	1.6118	1.6156	1.6193	1.6231	1.6270	1.6308	1.6347
20	1.6386	1.6426	1.6466	1.6506	1.6547	1.6588	1.6630	1.6672	1.6714	1.6757
30	1.6800	1.6844	1.6888	1.6932	1.6977	1.7023	1.7069	1.7115	1.7162	1.7209
40	1.7257	1.7305	1.7354	1.7404	1.7454	1.7504	1.7555	1.7607	1.7659	1.7712

SPECIFIC VOLUME OF LIQUID AMMONIA UNDER SATURATION PRESSURE, cm^3/g .—(Continued)

$t, ^\circ\text{C}$	0	1	2	3	4	5	6	7	8	9
50	1.7766	1.7820	1.7875	1.7931	1.7987	1.8044	1.8102	1.8160	1.8220	1.8280
60	1.8341	1.8403	1.8465	1.8529	1.8593	1.8658	1.8725	1.8792	1.8860	1.8930
70	1.9000	1.9072	1.9145	1.9219	1.9294	1.9370	1.9448	1.9528	1.9608	1.9690
80	1.9774	1.9859	1.9946	2.0034	2.0124	2.0217	2.0311	2.0407	2.0505	2.0605
90	2.0708	2.0813	2.0920	2.1030	2.1143	2.1258	2.1377	2.1498	2.1623	2.1752
100	2.1885	2.2021	2.2162	2.2307	2.2510	2.2612	2.2773	2.2940	2.3112	2.3292
110	2.3478	2.3674	2.3877	2.4080	2.4314	2.4548	2.4796	2.5058	2.5393	2.5632
120	2.5948	2.6288	2.6656	2.7055	2.7495	2.7979	2.8523	2.9142	2.9851	3.0710
130	3.1769	3.3175	3.5315	4.2830 (crit.)						

SPECIFIC VOLUME OF SATURATED NH_3 VAPOR, cm^3/g (7, 18, 21, 25, 29, 51, 55)

$$\log_{10} v = \frac{1939.032}{T} - 32.0661 + 10.70409 \log_{10} T + 8.62366 \times 10^{-2}(406.1 - T)^{1/2} + 2.667 \times 10^{-3}(406.1 - T); T = (273.1 + t);$$

range, -70 to $+50^\circ\text{C}$

$t, ^\circ\text{C}$	0	1	2	3	4	5	6	7	8	9
-70	8 976.2	9 617.9	10 314	11 069	11 889	12 781	13 752	14 809		
-60	4 690.3	4 988.9	5 310.0	5 655.8	6 028.3	6 429.9	6 863.3	7 331.2	7 837.0	8 384.1
-50	2 620.7	2 770.3	2 929.9	3 100.7	3 283.4	3 479.0	3 688.5	3 913.1	4 154.0	4 412.5
-40	1 550.2	1 630.0	1 714.7	1 804.8	1 900.5	2 002.4	2 110.8	2 226.3	2 349.4	2 480.7
-30	962.82	1 007.8	1 055.3	1 105.5	1 158.7	1 214.8	1 274.4	1 337.4	1 404.2	1 475.1
-20	623.48	650.06	678.03	707.45	738.44	771.06	805.44	841.69	879.92	920.25
-10	418.46	434.84	452.02	470.02	488.88	508.68	529.45	551.25	574.15	598.20
- 0	289.62	300.10	311.04	322.47	334.42	346.90	359.95	373.59	387.87	402.82
+ 0	289.62	279.58	269.95	260.73	251.88	243.39	235.25	227.43	219.92	212.71
10	205.79	199.13	192.73	186.58	180.66	174.97	169.49	164.22	159.14	154.25
20	149.53	144.99	140.61	136.39	132.33	128.40	124.61	120.96	117.43	114.02
30	110.73	107.55	104.48	101.51	98.640	95.865	93.181	90.586	88.074	85.643
40	83.290	81.012	78.806	76.670	74.600	72.594	70.650	68.766	66.939	65.167
50	63.448									

50 to 100° (53, 55)

$t, ^\circ\text{C}$	50	60	70	80	90	100
cm^3/g	63.49	48.8	37.7	29.3	22.8	17.6

 CO_2

VAPOR PRESSURE OF THE LIQUID IN ATM. (1, 2, 4, 12, 19, 31, 33, 36, 43, 45, 46, 48, 49, 52)

$$\log_{10} P = 1.8630096 - \frac{T_c - T}{T} [3.0067 - 9.03453 \times 10^{-3}(T_c - T) + 2.37353 \times 10^{-4}(T_c - T)^2 - 3.7788 \times 10^{-6}(T_c - T)^3 + 3.27304 \times 10^{-8}(T_c - T)^4 - 1.11383 \times 10^{-10}(T_c - T)^5]; T_c = (273.1 + 31.1); \text{range, } -56.6 \text{ to } 31.1^\circ\text{C}$$

$t, ^\circ\text{C}$	0	1	2	3	4	5	6	7	8	9
-56.6	5.1148									
-50	6.7446	6.4751	6.2139	5.9608	5.7156	5.4782	5.2485			
-40	9.9251	9.5650	9.2147	8.8740	8.5426	8.2207	7.9078	7.6039	7.3089	7.0225
-30	14.099	13.631	13.176	12.733	12.299	11.877	11.466	11.065	10.675	10.295
-20	19.437	18.845	18.267	17.702	17.150	16.611	16.084	15.569	15.067	14.577
-10	26.129	25.393	24.673	23.967	23.277	22.601	21.940	21.293	20.661	20.042
- 0	34.379	33.478	32.595	31.728	30.879	30.046	29.231	28.431	27.648	26.881
+ 0	34.379*	35.298	36.235	37.190	38.163	39.155	40.166	41.197	42.247	43.316
10	44.406	45.517	46.648	47.800	48.974	50.170	51.388	52.629	53.895	55.182
20	56.495	57.833	59.197	60.588	62.006	63.452	64.928	66.434	67.971	69.540
30	71.143	72.780								
31.1	72.947									

* A new determination by Bridgeman (9) gives 34.4009 ± 0.0013 atm. at 0° and this value is recommended as a fixed point for the calibration of pressure gages.

SPECIFIC VOLUME OF LIQUID CARBON DIOXIDE UNDER SATURATION PRESSURE, cm^3/g (1, 6, 13, 26)

$$\frac{1}{v} = 0.925 - 5.8836 \times 10^{-3}t - 4.4189 \times 10^{-5}t^2 - 1.3486 \times 10^{-6}t^3 - 3.64025 \times 10^{-8}t^4 - 3.2475 \times 10^{-10}t^5; \text{range, } -40 \text{ to } +20^\circ\text{C}$$

$t, ^\circ\text{C}$	0	1	2	3	4	5	6	7	8	9
-56.6	0.8482									
-50	0.8658	0.8636	0.8606	0.8576	0.8554	0.8525	0.8496			
-40	0.8961	0.8929	0.8897	0.8865	0.8834	0.8803	0.8780	0.8749	0.8718	0.8688
-30	0.9302	0.9268	0.9226	0.9191	0.9158	0.9124	0.9091	0.9058	0.9025	0.8993

SPECIFIC VOLUME OF LIQUID CARBON DIOXIDE UNDER SATURATION PRESSURE, cm^3/g .—(Continued)

$t, ^\circ\text{C}$	0	1	2	3	4	5	6	7	8	9
-20	0.9699	0.9653	0.9615	0.9579	0.9533	0.9497	0.9452	0.9416	0.9381	0.9337
-10	1.0194	1.0142	1.0091	1.0040	0.9990	0.9940	0.9892	0.9843	0.9794	0.9747
- 0	1.0810	1.0753	1.0683	1.0616	1.0548	1.0482	1.0428	1.0362	1.0309	1.0256
+ 0	1.0811	1.0881	1.0953	1.1025	1.1099	1.1186	1.1261	1.1350	1.1442	1.1534
10	1.1628	1.1737	1.1834	1.1947	1.2063	1.2195	1.2330	1.2469	1.2626	1.2788
20	1.2953	1.3141	1.3351	1.3587	1.3831	1.4104	1.4430	1.4815	1.5267	1.5873
30	1.6722	1.8692								
31.1	2.1547									

SPECIFIC VOLUME OF SATURATED CO_2 VAPOR, cm^3/g (1, 6, 13)

$$\frac{1}{v} = 0.09743 + 2.854 \times 10^{-3}t + 4.419 \times 10^{-5}t^2 + 1.349 \times 10^{-6}t^3 + 3.640 \times 10^{-8}t^4 + 3.25 \times 10^{-10}t^5; \text{range, } -40 \text{ to } +20^\circ\text{C}$$

$t, ^\circ\text{C}$	0	1	2	3	4	5	6	7	8	9
-30	27.19									
-20	19.22	19.91	20.62	21.36	22.11	22.89	23.71	24.53	25.40	26.26
-10	13.83	14.27	14.73	15.21	15.70	16.23	16.78	17.35	17.95	18.57
- 0	10.26	10.57	10.88	11.21	11.54	11.89	12.25	12.62	13.01	13.41
+ 0	10.26	9.97	9.68	9.41	9.13	8.85	8.59	8.33	8.06	7.81
10	7.57	7.30	7.04	6.80	6.58	6.33	6.14	5.92	5.68	5.46
20	5.26	5.05	4.83	4.61	4.39	4.35	3.97	3.76	3.53	3.28
30	3.00	2.54								
31.1	2.15									

 SO_2

VAPOR PRESSURE OF THE LIQUID IN ATM. (8, 11, 19, 39, 42, 44, 47, 48) $T_B = \text{B. P., } ^\circ\text{K}$

$$\log_{10} P = \frac{T - T_B}{T} [5.0762 - 4.03843 \times 10^{-3}(T - T_B) + 1.79492 \times 10^{-5}(T - T_B)^2 + 1.27073 \times 10^{-7}(T - T_B)^3 - 8.50057 \times 10^{-10}(T - T_B)^4]; T_B = (273.1 + 9.99); \text{range, } -70 \text{ to } +40^\circ\text{C}$$

$t, ^\circ\text{C}$	0	2	4	6	8	$t, ^\circ\text{C}$	0	5
-70	0.02635	0.02236	0.02145*			50	8.176	9.385
-60	.05699	.04916	.04227	0.03623	0.03095	60	10.729	12.219
-50	.11411	.09989	.08719	.07589	.06586	70	13.867	15.684
-40	.2135	.1893	.1674	.1477	.1300	80	17.682	19.872
-30	.3759	.3371	.3018	.2695	.2401	90	22.268	24.878
-20	.6274	.5686	.5142	.4641	.4181	100	27.714	30.784
-10	.9995	.9138	.8340	.7599	.6911	110	34.091	37.641
- 0	1.529	1.408	1.295	1.190	1.091	120	41.432	45.457
+ 0	1.529	1.657	1.793	1.938	2.092	130	49.705	54.157
10	2.256	2.429	2.613	2.807	3.012	140	58.783	63.549
20	3.228	3.456	3.697	3.951	4.217	150	68.405	73.296
30	4.498	4.793	5.102	5.427	5.768	157	75.245	
40	6.125	6.499	6.890	7.300	7.729			

* At -72.5° .

SPECIFIC VOLUME OF THE LIQUID UNDER SATURATION PRESSURE (3, 13, 14, 35)

$$\frac{1}{V} = 1.434 - 2.486 \times 10^{-3}t - 2.63 \times 10^{-6}t^2 - 5.591 \times 10^{-8}t^3 + 8.1 \times 10^{-11}t^4; \text{range, } -50 \text{ to } +90^\circ\text{C}$$

t	cm^3/g	t	cm^3/g	t	cm^3/g	t	cm^3/g	t	cm^3/g	t	cm^3/g
-50	0.6423	20	0.6998	26	0.7315	50	0.7722	74	0.8230	98	0.8913
-45	0.6472	40	0.7022	28	0.7348	52	0.7758	76	0.8278	100	0.8977
-40	0.6523	60	0.7047	30	0.7375	54	0.7794	78	0.8333	105	0.9158
-35	0.6575	80	0.7072	32	0.7407	56	0.7837	80	0.8382	110	0.9355
-30	0.6627	100	0.7097	34	0.7440	58	0.7874	82	0.8432	115	0.9570
-25	0.6680	120	0.7123	36	0.7474	60	0.7918	84	0.8489	120	0.9823
-20	0.6739	140	0.7153	38	0.7508	62	0.7962	86	0.8547	125	1.0111
-15	0.6798	160	0.7179	40	0.7536	64	0.8000	88	0.8606	130	1.0449
-10	0.6859	180	0.7205	42	0.7570	66	0.8046	90	0.8658	135	1.0858
- 5	0.6916	200	0.7231	44	0.7610	68	0.8091	92	0.8718	140	1.1363
0	0.6974	220	0.7262	46	0.7646	70	0.8137	94	0.8780	145	1.2019
		240	0.7289	48	0.7680	72	0.8183	96	0.8850	150	1.3038
										157.2	1.9305

SPECIFIC VOLUME OF THE VAPOR UNDER SATURATION PRESSURE, cm^3/g (13, 14)

$t, ^\circ\text{C}$	0	2	4	6	8
0					156.3
10	147.1	137.0	128.2	119.0	111.1
20	103.1	97.09	90.91	86.21	81.30
30	75.76	70.92	66.67	62.50	58.14
40	54.64	51.02	48.08	45.25	42.74
50	40.65	38.61	36.76	34.84	33.33
60	31.85	30.49	29.15	28.01	26.88
70	25.77	24.81	23.81	22.88	21.93
80	20.92	19.96	19.01	18.15	17.24
90	16.39	15.60	14.88	14.20	13.51
100	12.94	12.32	11.76	11.25	10.79
110	10.31	9.833	9.381	8.937	8.503
120	8.078	7.669	7.267	6.878	6.502
130	6.146	5.800	5.473	5.147	4.845
140	4.554	4.274	4.008	3.755	3.509
150	3.256	2.990	2.670		

LITERATURE

For a key to the periodicals see end of volume)

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VAPOR PRESSURES AND ORTHOBARIC DENSITIES ABOVE ONE ATMOSPHERE, TWO-PHASE, LIQUID—VAPOR, ORGANIC COMPOUNDS¹

ALBERT F. O. GERMANN

p = vapor pressure in normal atmospheres.

d_l (resp. d_v) = density of saturated liquid (resp. vapor) in g per cm³.

$d_m = \frac{1}{2}(d_l + d_v)$.

Accuracy, ca. ± 5 in last figure given.

All values at the critical point are given in bold-face type.

C-TABLE, THE C-ARRANGEMENT

CCl₂O Phosgene (1, 10, 11, 17)

$t, ^\circ\text{C}$	$p_{\text{atm.}}$	d_l	d_v
7.95	1.00	1.409	0.005
10	1.08	1.405	0.005
20	1.55	1.381	0.007
30	2.17	1.357	0.009
40	2.97	1.332	0.012
50	3.99	1.306	0.016
60	5.25	1.280	0.020
70	6.81	1.252	0.024
80	8.68	1.224	0.030
90	10.94	1.195	0.037
100	13.6	1.165	0.046
110	16.7	1.134	0.057
120	20.3	1.100	0.072
130	24.4	1.062	0.090
140	29.1	1.017	0.112
150	34.4	0.966	0.142
160	40.4	0.903	0.182
170	47.0	0.826	0.239
180	54.4	0.685	0.359
182	56	0.520	

$$d_m = 0.715 - 1070 \times 10^{-6}t.$$

CH₄O Methyl Alcohol (25, 37)

$t, ^\circ\text{C}$	$p_{\text{atm.}}$	d_l	d_v
64.7	1.000	0.7510	0.001222
70	1.220	.7460	.001465
80	1.764	.7355	.002084
90	2.494	.7250	.002907
100	3.452	.7140	.003984
110	4.688	.7020	.005376
120	6.255	.6900	.007142
130	8.213	.6770	.009379
140	10.63	.6640	.01216
150	13.57	.6495	.01562
160	17.11	.6340	.01994
170	21.34	.6160	.02526
180	26.35	.5980	.03186
190	32.23	.5770	.04010
200	39.08	.5530	.05075
210	47.03	.5255	.06521
220	56.18	.4900	.08635
225	61.25	.4675	.1003
230	66.67	.4410	.1187
235	72.47	.4054	.1438
240.0	78.67	0.2722	

$$d_m = 0.4050 - 447.9 \times 10^{-6}t + 133 \times 10^{-9}t^2 - 2376 \times 10^{-12}t^3.$$

¹ Except hydrocarbons and their halogen derivatives for which v. p. 244.

CH₄S Methylmercaptan (3)

$t, ^\circ\text{C}$	$p_{\text{atm.}}$	d_l	d_v
6.0	1.000	0.888	0.002
10	1.16	.882	.002
20	1.68	.868	.003
30	2.36	.854	.004
40	3.22	.840	.004
50	4.33	.827	.005
60	5.68	.813	.005
70	7.36	.799	.006
80	9.33	.783	.008
90	11.7	.768	.011
100	14.5	.752	.015
110	17.6	.734	.020
120	21.3	.714	.027
130	25.5	.692	.036
140	30.3	.669	.048
150	35.7	.643	.062
160	41.6	.612	.079
170	48.6	.577	.102
180	56.2	.535	.131
190	65.0	.477	.179
196.8	71.4	0.323	

$$d_m = 0.449 - 675 \times 10^{-6}t + 180 \times 10^{-9}t^2.$$

CH₅N Methylamine (2)

$t, ^\circ\text{C}$	$p_{\text{atm.}}$	$t, ^\circ\text{C}$	$p_{\text{atm.}}$
-6.6	1.000	80	16.7
0	1.33	90	20.9
+10	2.00	100	25.9
20	2.92	110	31.9
30	4.16	120	38.5
40	5.93	130	46.3
50	7.70	140	55.1
60	10.15	150	65.5
70	13.12	156.9	73.6

C₂H₃N Acetonitrile (31); cf. (29, 32)

$t, ^\circ\text{C}$	$p_{\text{atm.}}$	d_l	d_v
80		0.717	0.001
90		.706	.002
100		.694	.002
110		.682	.003
120		.670	.004
130		.658	.005
140		.646	.007
150		.633	.009
160		.620	.011
170		.605	.013
180		.590	.015
190		.573	.018
200		.555	.022
210		.536	.027
220		.514	.034
230		.492	.042
240		.467	.053
250		.439	.068

C₂H₃N.—(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
260		0.399	0.091
270		.342	.139
274.7		0.240	

$$d_m = 0.402 - 495 \times 10^{-6}t - 350 \times 10^{-9}t^2.$$

C₂H₄O₂ Acetic Acid (21, 22, 36, 37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
118.5	1.000	0.9380	0.003150
120	1.058	.9362	.003271
130	1.426	.9235	.004275
140	1.884	.9091	.005515
150	2.452	.8963	.00703
160	3.149	.8829	.00887
170	3.994	.8694	.01084
180	5.014	.8555	.01370
190	6.233	.8413	.01681
200	7.682	.8265	.02052
210	9.391	.8109	.02488
220	11.39	.7941	.03021
230	13.73	.7764	.03626
240	16.42	.7571	.04327
250	19.52	.7364	.05163
260	23.07	.7136	.06165
270	27.11	.6900	.07365
280	31.67	.6629	.0883
290	36.79	.6334	.1073
300	42.54	.5950	.1331
310	48.93	.5423	.1718
320	56.01	.4615	.2417
321.6	57.21	0.3506	

$$d_m = 0.5355 - 536.6 \times 10^{-6}t - 119.1 \times 10^{-9}t^2.$$

C₂H₄O₂ Methyl Formate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
31.9	1.000	0.9569	0.002468
40	1.355	.9447	.003236
50	1.903	.9294	.004456
60	2.608	.9133	.006039
70	3.500	.8968	.008032
80	4.610	.8803	.01049
90	5.969	.8634	.01350
100	7.614	.8452	.01723
110	9.582	.8264	.02160
120	11.91	.8070	.02688
130	14.64	.7860	.03344
140	17.83	.7638	.04124
150	21.46	.7403	.05063
160	25.64	.7136	.06231
170	30.40	.6844	.07634
180	35.76	.6521	.09434
190	41.78	.6148	.1178
200	48.50	.5658	.1524
210	55.95	.4857	.2188
214.0	59.15	0.3489	

$$d_m = 0.5020 - 701.3 \times 10^{-6}t - 66.5 \times 10^{-9}t^2.$$

C₂H₆O Ethyl Alcohol (23, 37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
78.3	1.000	0.7365	0.00165
80	1.069	.7348	.00174
90	1.562	.7251	.00250
100	2.228	.7157	.00351
110	3.107	.7057	.00486
120	4.243	.6925	.00658

C₂H₆O.—(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
130	5.685	0.6789	0.00877
140	7.486	.6631	.01152
150	9.700	.6489	.01488
160	12.39	.6329	.01916
170	15.61	.6165	.02446
180	19.44	.5984	.03115
190	23.94	.5782	.0397
200	29.20	.5568	.0508
210	35.31	.5291	.0655
220	42.38	.4958	.0854
230	50.53	.4550	.1135
240	59.92	.3825	.1715
243.1	63.11	0.2755	

$$d_m = 0.4028 - 382.7 \times 10^{-6}t - 594.0 \times 10^{-9}t^2 + 65.1 \times 10^{-12}t^3.$$

C₂H₆O Methyl Ether (*p*) (5, 27); (*d*) (6)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
−23.7	1.000	0.7222	0.0024
−20	1.17	.7174	.0027
−10	1.74	.7040	.0039
0	2.54	.6905	.0055
+10	3.59	.6759	.0076
20	4.95	.6610	.0104
30	6.62	.6455	.0142
40	8.69	.6292	.0188
50	11.25	.6116	.0241
60	14.27	.5932	.0306
70	17.90	.5735	.0385
80	22.10	.5517	.0484
90	26.9	.5257	.0623
100	32.6	.4950	.0810
110	39.0	.4575	.1060
115	42.5	.4350	.1222
120	46.3	.4040	.1465
125	50.3	.3510	.1930
126.9	52.0	0.2714	

$$d_m = 0.3480 - 604.0 \times 10^{-6}t.$$

C₂H₆S Methyl Sulfide (*p*) (3); (*d*) (3, 12)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
35.8	1.000	0.831	0.002
40	1.15	.826	.003
50	1.60	.814	.003
60	2.15	.803	.003
70	2.84	.791	.004
80	3.68	.777	.006
90	4.70	.764	.008
100	5.97	.750	.010
110	7.45	.736	.013
120	9.14	.721	.016
130	11.1	.706	.020
140	13.4	.689	.026
150	16.0	.671	.032
160	19.1	.652	.040
170	22.4	.632	.050
180	26.2	.610	.063
190	30.6	.585	.076
200	35.6	.559	.092
210	41.5	.528	.113
220	47.0	.486	.146
229.9	54.6	0.306	

$$d_m = 0.437 - 570 \times 10^{-6}t.$$

C₂H₆S Ethylmercaptan (3)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
34.4	1.000	0.822	0.002
40	1.21	.815	.003
50	1.66	.803	.003
60	2.22	.790	.004
70	2.95	.777	.006
80	3.84	.762	.007
90	4.92	.749	.009
100	6.24	.735	.012
110	7.80	.721	.015
120	9.64	.706	.019
130	11.8	.689	.023
140	14.3	.672	.029
150	17.2	.653	.036
160	20.5	.634	.044
170	24.2	.613	.054
180	28.2	.590	.065
190	33.0	.564	.079
200	38.2	.534	.095
210	44.1	.499	.117
220	50.5	.444	.161
225.5	54.2		0.301

$$d_m = 0.432 - 580 \times 10^{-6}t - 50.0 \times 10^{-9}t^2.$$

C₂H₇N Dimethylamine (2)**C₂H₇N Ethylamine (2)**

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
7.2	1.000	16.6	1.000
10	1.12	20	1.14
20	1.66	30	1.65
30	2.38	40	2.34
40	3.32	50	3.23
50	4.55	60	4.35
60	6.04	70	5.77
70	7.93	80	7.48
80	10.2	90	9.57
90	12.9	100	12.1
100	16.0	110	15.0
110	19.7	120	18.5
120	23.9	130	22.5
130	28.8	140	27.0
140	34.4	150	32.4
150	40.8	160	38.4
160	48.0	170	44.9
164.6	51.7	180	52.9
		183.2	55.5

C₃H₅N Propionitrile (31); cf. (29)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
90		0.711	0.002
100		.700	.002
110		.689	.003
120		.678	.003
130		.666	.004
140		.654	.005
150		.642	.006
160		.629	.007
170		.615	.008
180		.602	.010
190		.588	.012
200		.573	.015
210		.557	.019
220		.541	.025
230		.524	.033
240		.505	.041

C₃H₅N.—(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
250		0.483	0.051
260		.458	.063
270		.428	.080
280		.388	.108
290		.311	.171
291.2			0.241

$$d_m = 0.400 - 475 \times 10^{-6}t - 250 \times 10^{-9}t^2.$$

C₃H₆O Acetone (p) (14, 27); cf. (32); (d) (12); cf. (28, 29, 33, 35)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
56.1	1.000	0.750	0.002
60	1.14	.746	.003
70	1.58	.734	.003
80	2.12	.719	.004
90	2.81	.706	.005
100	3.67	.693	.007
110	4.74	.679	.009
120	6.01	.665	.011
130	7.53	.650	.013
140	9.33	.634	.016
150	11.5	.618	.020
160	13.9	.601	.024
170	16.6	.588	.030
180	20.0	.568	.039
190	23.8	.540	.050
200	28.0	.514	.065
210	32.7	.482	.085
220	38.1	.443	.110
230	44.1	.393	.152
235	47.0		0.268

$$d_m = 0.405 - 525 \times 10^{-6}t - 250 \times 10^{-9}t^2.$$

C₃H₆O₂ Propionic Acid (13); cf. (7, 9, 18, 19)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
140		0.860	0.004
150		.848	.004
160		.837	.005
170		.825	.006
180		.813	.008
190		.800	.010
200		.786	.012
210		.772	.015
220		.757	.019
230		.740	.024
240		.722	.029
250		.703	.035
260		.683	.043
270		.663	.051
280		.642	.060
290		.619	.071
300		.595	.083
339.5			0.315

$$d_m = 0.508 - 530 \times 10^{-6}t - 110 \times 10^{-9}t^2.$$

C₃H₆O₂ Ethyl Formate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
54.35	1.000	0.8767	0.002843
60	1.208	.8689	.003370
70	1.667	.8552	.004570
80	2.251	.8409	.006098
90	2.983	.8262	.007994
100	3.883	.8112	.01032
110	4.978	.7955	.01312
120	6.290	.7796	.01657
130	7.846	.7628	.02073

C₃H₆O₂—(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
140	9.674	0.7448	0.02564
150	11.80	.7257	.03164
160	14.26	.7058	.03876
170	17.07	.6843	.04739
180	20.28	.6610	.05747
190	23.91	.6355	.07018
200	28.00	.6066	.08621
210	32.59	.5724	.1073
220	37.70	.5290	.1379
225	40.47	.5014	.1587
230	43.39	.4635	.1890
235.3	46.65	0.3232	

$$d_m = 0.4741 - 625.1 \times 10^{-6}t - 69.4 \times 10^{-9}t^2.$$

C₃H₆O₂ Methyl Acetate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
57.15	1.000	0.8840	0.002830
60	1.104	.8800	.003076
70	1.537	.8662	.004193
80	2.092	.8519	.005618
90	2.791	.8374	.007440
100	3.659	.8221	.009671
110	4.719	.8060	.01239
120	5.998	.7893	.01570
130	7.523	.7715	.01970
140	9.325	.7532	.02454
150	11.43	.7339	.03026
160	13.88	.7133	.03731
170	16.71	.6907	.04598
180	19.95	.6671	.05682
190	23.64	.6410	.06993
200	27.84	.6100	.08658
210	32.56	.5741	.1091
220	37.92	.5281	.1416
230	43.92	.4527	.2028
233.7	46.31	0.3252	

$$d_m = 0.4799 - 628.0 \times 10^{-6}t - 146.7 \times 10^{-9}t^2$$

C₃H₈O Propyl Alcohol (26, 37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
97.4	1.000	0.7351	0.00208
100	1.100	.7325	.00226
110	1.577	.7220	.00320
120	2.208	.7110	.00443
130	3.022	.6995	.00605
140	4.055	.6875	.00805
150	5.341	.6740	.01060
160	6.915	.6600	.01380
170	8.817	.6450	.01770
180	11.08	.6285	.0225
190	13.75	.6110	.0282
200	16.86	.5920	.0353
210	20.46	.5715	.0442
220	24.57	.5485	.0556
230	29.26	.5230	.0704
240	34.57	.4920	.0904
250	40.55	.4525	.1180
260	47.27	.3905	.1610
263.7	49.95	0.2734	

$$d_m = 0.4095 - 379.0 \times 10^{-6}t - 375.0 \times 10^{-9}t^2 - 553.3 \times 10^{-12}t^3.$$

C₃H₈O Methyl Ethyl Ether (3)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
7.5	1.000	0.716	0.003
10	1.10	.713	.004
20	1.61	.700	.006
30	2.29	.687	.008
40	3.14	.672	.010
50	4.24	.658	.013
60	5.56	.644	.016
70	7.21	.628	.019
80	9.16	.612	.023
90	11.4	.596	.029
100	14.2	.579	.034
110	17.3	.560	.040
120	20.9	.540	.050
130	25.0	.516	.064
140	29.6	.487	.082
150	34.7	.450	.109
160	40.5	.401	.153
164.7	43.4	0.270	

$$d_m = 0.364 - 570 \times 10^{-6}t.$$

C₃H₉N Propylamine (2)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
48.4	1.000	140	11.8
50	1.06	150	14.4
60	1.49	160	17.2
70	2.06	170	20.3
80	2.79	180	24.2
90	3.71	190	28.4
100	4.82	200	32.9
110	6.17	210	38.1
120	7.76	220	43.9
130	9.64	223.8	46.3

C₄H₆O₄ Dimethyl Oxalate (27, 34)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
163.3	1.000	220	4.17
170	1.20	230	5.19
180	1.59	240	6.37
190	2.06	250	7.76
200	2.62	260	9.48
210	3.32		

C₄H₈O₂ *n*-Butyric Acid (13); cf. (7, 8, 28, 40)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
160		0.818	0.003
170		.807	.003
180		.796	.004
190		.784	.005
200		.771	.007
210		.758	.009
220		.744	.012
230		.730	.015
240		.715	.018
250		.700	.022
260		.685	.027
270		.669	.032
280		.652	.038
290		.633	.045
300		.612	.053
355		0.302	

$$d_m = 0.487 - 450 \times 10^{-6}t - 200 \times 10^{-9}t^2.$$

C₄H₈O₂ Isobutyric Acid (13); cf. (20, 28)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
150		0.812	0.003
160		.801	.004
170		.789	.005
180		.777	.007
190		.764	.009
200		.751	.012
210		.737	.015
220		.723	.018
230		.708	.022
240		.692	.026
250		.675	.032
260		.657	.039
270		.638	.047
280		.617	.056
290		.594	.067
300		.569	.080
336			0.304

$$d_m = 0.485 - 500 \times 10^{-6}t - 120 \times 10^{-9}t^2.$$

C₄H₈O₂ Propyl Formate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
80.9	1.000	0.8330	0.003136
90	1.320	.8214	.004107
100	1.769	.8080	.005432
110	2.327	.7947	.007047
120	3.010	.7811	.009033
130	3.836	.7670	.01140
140	4.821	.7523	.01422
150	5.984	.7369	.01770
160	7.343	.7209	.02179
170	8.921	.7045	.02667
180	10.74	.6873	.03236
190	12.82	.6691	.03891
200	15.20	.6487	.04717
210	17.90	.6259	.05698
220	20.94	.6024	.06897
230	24.39	.5757	.08403
240	28.27	.5438	.1045
250	32.63	.5025	.1340
260	37.54	.4404	.1848
264.85	40.13		0.3093

$$d_m = 0.4647 - 574.8 \times 10^{-6}t - 45.9 \times 10^{-9}t^2.$$

C₄H₈O₂ Methyl Propionate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
79.7	1.000	0.8412	0.003173
80	1.006	.8408	.003199
90	1.379	.8273	.004301
100	1.851	.8137	.005714
110	2.440	.7996	.007446
120	3.165	.7852	.009569
130	4.043	.7705	.01214
140	5.096	.7553	.01529
150	6.345	.7390	.01905
160	7.812	.7221	.02356
170	9.523	.7045	.02907
180	11.50	.6856	.03552
190	13.78	.6657	.04320
200	16.38	.6445	.05236
210	19.33	.6207	.06390
220	22.68	.5938	.07812
230	26.46	.5635	.09662
240	30.70	.5220	.1236

C₄H₈O₂—(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
245	33.01	0.4976	0.1418
250	35.46	.4655	.1675
255	38.04	.4151	.2118
257.4	39.34		0.3124

$$d_m = 0.4696 - 592.1 \times 10^{-6}t - 72.9 \times 10^{-9}t^2.$$

C₄H₈O₂ Ethyl Acetate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
77.15	1.000	0.8283	0.003230
80	1.093	.8245	.003495
90	1.494	.8112	.004677
100	2.000	.7972	.006158
110	2.630	.7831	.008006
120	3.404	.7683	.01030
130	4.340	.7533	.01314
140	5.461	.7378	.01650
150	6.789	.7210	.02070
160	8.349	.7033	.02577
170	10.17	.6848	.03165
180	12.27	.6653	.03883
190	14.68	.6441	.04751
200	17.45	.6210	.05797
210	20.59	.5944	.07128
220	24.15	.5648	.08905
230	28.16	.5281	.1131
240	32.68	.4778	.1499
245	35.14	.4401	.1802
250	37.74		
250.1	37.80		0.3077

$$d_m = 0.4624 - 599.2 \times 10^{-6}t - 76.4 \times 10^{-9}t^2.$$

C₄H₁₀O Ethyl Ether (24, 37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
34.6	1.000	0.6962	0.003162
40	1.212	.6894	.003731
50	1.680	.6764	.005079
60	2.275	.6658	.006771
70	3.021	.6532	.00892
80	3.939	.6402	.01155
90	5.054	.6250	.01477
100	6.394	.6105	.01867
110	7.987	.5942	.02349
120	9.861	.5764	.02934
130	12.05	.5580	.03638
140	14.58	.5385	.04488
150	17.48	.5179	.05551
160	20.80	.4947	.06911
170	24.57	.4658	.08731
180	28.81	.4268	.1135
185	31.12	.4018	.1320
190	33.57	.3663	.1620
193.8	35.52		0.2625

$$d_m = 0.3685 - 537.7 \times 10^{-6}t - 47.5 \times 10^{-9}t^2.$$

C₄H₁₀S Ethyl Sulfide (3)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
90.3	1.000	0.765	0.003
100	1.32	.755	.003
110	1.75	.744	.004
120	2.26	.732	.005
130	2.90	.721	.006
140	3.66	.709	.008
150	4.58	.697	.009
160	5.68	.684	.011

C₄H₁₀S.—(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d_l</i>	<i>d_v</i>
170	6.93	0.671	0.013
180	8.36	.656	.017
190	10.00	.641	.022
200	12.0	.625	.027
210	14.2	.608	.034
220	16.6	.590	.041
230	19.3	.571	.050
240	22.3	.549	.061
250	25.6	.524	.075
260	29.3	.494	.094
270	33.2	.457	.121
280	37.6	.395	.175
283.8	39.1	0.279	

$$d_m = 0.428 - 470 \times 10^{-6}t - 200 \times 10^{-9}t^2.$$

C₄H₁₁N Diethylamine (*p*) (2); (*d*) (12, 16)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d_l</i>	<i>d_v</i>
55.4	1.000	0.668	0.003
60	1.16	.663	.003
70	1.59	.652	.004
80	2.13	.640	.005
90	2.82	.628	.006
100	3.67	.616	.008
110	4.70	.604	.011
120	5.92	.591	.014
130	7.39	.577	.018
140	9.10	.562	.022
150	11.1	.546	.028
160	13.4	.528	.035
170	15.9	.510	.043
180	18.9	.489	.053
190	22.2	.466	.065
200	25.8	.438	.080
210	30.0	.400	.103
220	34.4	.339	.150
223.5	36.2	0.246	

$$d_m = 0.364 - 515 \times 10^{-6}t - 50.0 \times 10^{-9}t^2.$$

C₅H₁₀O₂ Isobutyl Formate (15, 30)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
97.9	1.000	190	9.62
100	1.067	200	11.5
110	1.44	210	13.8
120	1.92	220	16.3
130	2.52	230	19.1
140	3.25	240	22.3
150	4.14	250	25.8
160	5.19	260	29.8
170	6.37	270	34.3
180	7.89	278	38

C₅H₁₀O₂ Propyl Acetate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d_l</i>	<i>d_v</i>
101.55	1.000	0.7938	0.003495
110	1.284	.7830	.004405
120	1.703	.7702	.005760
130	2.223	.7571	.007440
140	2.851	.7435	.009497
150	3.611	.7297	.01195
160	4.518	.7149	.01489
170	5.581	.6997	.01848
180	6.832	.6835	.02268
190	8.276	.6667	.02778
200	9.947	.6488	.03390

C₅H₁₀O₂.—(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d_l</i>	<i>d_v</i>
210	11.86	0.6301	0.04115
220	14.05	.6087	.05025
230	16.54	.5855	.06154
240	19.36	.5586	.07576
250	22.54	.5289	.09390
260	26.13	.4908	.1205
270	30.16	.4333	.1661
275	32.36	.3769	.2169
276.2	32.91	0.2957	

$$d_m = 0.4553 - 546.9 \times 10^{-6}t - 112.4 \times 10^{-9}t^2.$$

C₅H₁₀O₂ Ethyl Propionate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d_l</i>	<i>d_v</i>
99.0	1.000	0.7964	0.003489
100	1.027	.7951	.003580
110	1.383	.7823	.004748
120	1.828	.7692	.00620
130	2.376	.7548	.00800
140	3.042	.7413	.01024
150	3.840	.7267	.01292
160	4.788	.7115	.01615
170	5.904	.6958	.02004
180	7.206	.6795	.02469
190	8.727	.6625	.03012
200	10.45	.6443	.03676
210	12.45	.6243	.04464
220	14.73	.6027	.05435
230	17.33	.5784	.06667
240	20.28	.5501	.08230
250	23.62	.5181	.1030
260	27.40	.4744	.1337
265	29.48	.4459	.1562
270	31.69	.4018	.1957
272.9	33.03	0.2965	

$$d_m = 0.4564 - 564.4 \times 10^{-6}t - 78.4 \times 10^{-9}t^2.$$

C₅H₁₀O₂ Methyl Butyrate (39); cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d_l</i>	<i>d_v</i>
102.75	1.000	0.8035	0.003595
110	1.245	.7945	.004374
120	1.649	.7816	.005708
130	2.148	.7685	.007353
140	2.756	.7551	.009294
150	3.488	.7415	.01168
160	4.359	.7270	.01459
170	5.386	.7122	.01807
180	6.587	.6964	.02215
190	7.982	.6800	.02699
200	9.593	.6633	.03268
210	11.44	.6448	.03968
220	13.55	.6251	.04831
230	15.96	.6018	.05848
240	18.69	.5773	.07143
250	21.77	.5505	.08696
260	25.25	.5166	.1091
270	29.17	.4721	.1416
275	31.31	.4386	.1691
280	33.58	.3812	.2201
281.3	34.19	0.3002	

$$d_m = 0.4601 - 543.0 \times 10^{-6}t - 90.6 \times 10^{-9}t^2.$$

C₅H₁₀O₂ Methyl Isobutyrate (39), cf. (37)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
92.3	1.000	0.8040	0.003617
100	1.257	.7945	.004472
110	1.675	.7815	.005882
120	2.193	.7680	.007628
130	2.826	.7539	.009718
140	3.588	.7396	.01224
150	4.497	.7248	.01533
160	5.569	.7095	.01903
170	6.825	.6933	.02345
180	8.280	.6767	.02869
190	9.960	.6593	.03490
200	11.89	.6411	.04228
210	14.09	.6200	.05141
220	16.59	.5961	.06289
230	19.43	.5690	.07722
240	22.64	.5386	.09615
250	26.25	.5021	.1218
260	30.32	.4495	.1623
265	32.54	.4036	.2033
267.55	33.72	0.3012	

$$d_m = 0.4558 - 559.3 \times 10^{-6}t - 68.9 \times 10^{-9}t^2.$$

C₅H₁₂O Ethyl Propyl Ether (3)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
61.4	1.000	0.682	0.008
70	1.30	.672	.010
80	1.73	.659	.013
90	2.27	.646	.015
100	2.94	.633	.018
110	3.76	.620	.021
120	4.72	.607	.025
130	5.89	.593	.029
140	7.28	.579	.032
150	8.89	.564	.036
160	10.7	.548	.041
170	12.9	.530	.047
180	15.2	.511	.055
190	18.0	.491	.067
200	21.2	.462	.082
210	24.8	.433	.104
220	28.8	.385	.142
227.4	32.1	0.258	

$$d_m = 0.3785 - 530.0 \times 10^{-6}t.$$

C₆H₁₂O₂ Isobutyl Acetate (15)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
116.4	1.000	210	9.0
120	1.12	220	10.8
130	1.48	230	12.8
140	1.93	240	15.1
150	2.50	250	17.7
160	3.16	260	20.6
170	3.94	270	23.9
180	4.96	280	27.5
190	6.12	288	31
200	7.43		

C₆H₁₂O₂ Ethyl Isobutyrate (15)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
110	1.000	140	2.25
120	1.33	150	2.89
130	1.75	160	3.63

C₆H₁₂O₂—(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
170	4.49	230	14.2
180	5.60	240	16.7
190	6.85	250	19.5
200	8.31	260	22.6
210	10.05	270	26
220	12.0	280	30

C₆H₁₅N Triethylamine (12)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
90		0.661	0.005
100		.650	.006
110		.638	.008
120		.626	.010
130		.614	.013
140		.603	.016
150		.591	.019
160		.578	.022
170		.565	.026
180		.552	.030
190		.538	.035
200		.523	.040
210		.507	.046
220		.488	.056
230		.466	.071
240		.437	.090
250		.399	.115
260		.335	.175
262		0.251	

$$d_m = 0.373 - 440 \times 10^{-6}t - 100 \times 10^{-9}t^2.$$

C₇H₁₄O₂ Isopropyl Isobutyrate (38)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d</i> _l	<i>d</i> _v
120.76	1.000	0.7377	
130	1.298	.7264	
140	1.689	.7140	
150	2.163	.7014	
160	2.758	.6683	
170	3.443	.6751	
180	4.222	.6610	
190	5.165	.6468	
200	6.259	.6311	
210	7.507	.6145	
220	8.965	.5965	
230	10.58	.5770	0.0475
240		Begins to decompose	

C₁₂H₁₀O Diphenyl Ether (4)

$$\log_{10} p_{\text{mm}} = 7.771 - \frac{2600}{T}; \text{ range } 259.0 \text{ (B. P.) to } 360^\circ\text{C}$$

LITERATURE

(For a key to the periodicals see end of volume)

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903; 91. (³⁷) Young, 117, 12: 374; 10. (³⁸) Young and Fortey, 4, 81: 783; 02. (³⁹) Young and Thomas, 4, 63: 1191; 93. (⁴⁰) Zander, 13, 224: 56; 84.

VAPOR PRESSURES AND ORTHOBARIC DENSITIES OF HYDROCARBONS AND THEIR HALOGEN DERIVATIVES

JEAN TIMMERMANS

p = vapor pressures in mm Hg ($= \frac{1}{760} \text{Atm}$)

d_l (resp. d_v) = density of saturated liquid (resp. vapor) in g per cm^3

$d_m = \frac{1}{2} (d_l + d_v)$; range, B. P. to t_c

Accuracy: Young's data, 0.1% for the pressures and 0.0001 for the densities. Other authors' accuracy usually less, and indicated by the number of significant figures given.

All values at the critical point are given in bold-face type.

HYDROCARBONS

The ζ -Arrangement

C_1 AND C_2 HYDROCARBONS, *v. p.* 230

$\text{CH}_3\text{CH:CH}_2$ (3, 10, 17)

$t, ^\circ\text{C}$	p_{mm}	d_l
-47.8	760	
-40	1110	0.599
-30	1575	0.587
-20	2280	0.574
-10	3235	0.560
0	4400	0.546
+10	5800	0.531
20	7700	0.516
30	9900	
40	12400	
50	15500	
60	18900	
70	22800	

$$\log_{10} p = 7.340 - \frac{1066.1}{T}$$

C_4H_{10} (3, 10, 14)

$t, ^\circ\text{C}$	p_{mm}	$t, ^\circ\text{C}$	p_{mm}
-44.5	760	+20	6690
-20	1980	50	14750
0	3800	97.5	34200

$$\log_{10} p = 7.3402 - \frac{983.7}{T};$$

range, -125° to t_c .

$n\text{-C}_4\text{H}_{10}$ (3, 7, 17, 19)

$t, ^\circ\text{C}$	p_{mm}	$t, ^\circ\text{C}$	p_{mm}
-0.3	760	100	12800
+30	2550	130	20600
70	6700	153.2*	27100
		150.8†	28500
		*(7)	†(17)

$$\log_{10} p = 7.3948 - \frac{1224.5}{T};$$

range, M. P. to t_c .

For d_l up to 35° , see (8).

$iso\text{-C}_4\text{H}_{10}$ (3, 13, 17)

$t, ^\circ\text{C}$	p_{mm}	$t, ^\circ\text{C}$	p_{mm}
-11.5	760	90	12900
+30	3400	120	21700
60	7000	133.7	27750

$$\log_{10} p = 6.98 - \frac{1056.3}{T}; \text{ range, M. P. to } t_c.$$

$n\text{-C}_5\text{H}_{12}$ (18, 20)

$t, ^\circ\text{C}$	p_{mm}	d_l	d_v
36.15	760		
40	873	0.6062	0.0034
50	1193	0.5957	0.0045
60	1605	0.5850	0.0060
70	2119	0.5739	0.0079
80	2735	0.5624	0.0101
90	3500	0.5503	0.0129
100	4410	0.5377	0.0163
110	5485	0.5248	0.0202
120	6740	0.5107	0.0250
130	8190	0.4957	0.0310
140	9890	0.4787	0.0386
150	11810	0.4604	0.0476
160	14050	0.4394	0.0591
170	16550	0.4162	0.0735
180	19350	0.3867	0.0935
190	22500	0.3485	0.1269
195	24250	0.3065	0.1609
197.2	25100	0.2323	

$$d_m = 0.4402 - 0.0343413T - 0.073477T^2; \text{ range, M. P. to } t_c.$$

$$d_m = 0.3283 - 0.034610t; \text{ range, } 0^\circ \text{ to } t_c.$$

$iso\text{-C}_5\text{H}_{12}$ (18, 20)

$t, ^\circ\text{C}$	p_{mm}	d_l	d_v
27.95	760		
30	819	0.6092	0.0033
40	1140	0.5988	0.0045
50	1535	0.5881	0.0060
60	2036	0.5769	0.0078
70	2656	0.5656	0.0101
80	3385	0.5540	0.0129
90	4280	0.5413	0.0162
100	5345	0.5278	0.0202
110	6585	0.5140	0.0251
120	8020	0.4991	0.0311
130	9685	0.4826	0.0383
140	11630	0.4642	0.0473
150	13800	0.4445	0.0583
160	16300	0.4206	0.0729
170	19110	0.3914	0.0934
180	22270	0.3498	0.1258
185	24000	0.3142	0.1574
187.8	25000	0.2343	

$$d_m = 0.44806 - 0.0347586T + 0.072664T^2; \text{ range, M. P. to } t_c.$$

$$d_m = 0.3202 - 0.034658t + 0.07463t^2; \text{ range, } 0^\circ \text{ to } t_c.$$

C_6H_6 (20)

$t, ^\circ\text{C}$	p_{mm}	d_l	d_v
80.2	760		
90	1008	0.8041	0.0036
100	1335	0.7927	0.0047
110	1740	0.7809	0.0060
120	2230	0.7692	0.0077
130	2820	0.7568	0.0096
140	3520	0.7440	0.0118
150	4335	0.7310	0.0144
160	5300	0.7185	0.0173
170	6385	0.7043	0.0209
180	7620	0.6906	0.0249
190	9040	0.6758	0.0298
200	10650	0.6605	0.0355
210	12450	0.6432	0.0421
220	14520	0.6255	0.0502
230	16820	0.6065	0.0598
240	19350	0.5851	0.0714
250	22200	0.5609	0.0855
260	25350	0.5328	0.1038
270	28850	0.4984	0.1287
280	32800	0.4514	0.1660
288.5	36400	0.3045	

$$d_m = 0.4501 - 0.035248t + 0.07693t^2; \text{ range, M. P. to } t_c.$$

C_6H_{12} , CYCLOHEXANE (12, 20)

$t, ^\circ\text{C}$	p_{mm}	d_l	d_v
80.75	760	0.7199	0.0029*
90	992*	0.7098	0.0038*
100	1304*	0.6988	0.0049*
110	1687*	0.6883	0.0063*
120	2140	0.6775	0.0080*
130	2695	0.6667	0.0100*
140	3355	0.6553	0.0123
150	4140	0.6435	0.0150
160	5040	0.6313	0.0184
170	6095		
180	7285	0.6060	0.0265
190	8630	0.5917	0.0317
200	10130	0.5773	0.0380
210	11825	0.5614	0.0450
220	13690	0.5443	0.0534
230	15810	0.5257	0.0632
240	18140	0.5058	0.0746
250	20700	0.4824	0.0896
260	23590	0.4537	0.1097
270	26830	0.4154	0.1401
281.0	30835	0.2703	

* Values from Young, who used

C_6H_{12} which was not absolutely pure it melted at 4.7° instead of 6.5° and its density (d_4^{20}) was 0.7826 instead of 0.7832.

$$d_m = 0.3942 - 0.000433t; \text{ range, M. P. to } t_c.$$

$n\text{-C}_6\text{H}_{14}$ (20)

$t, ^\circ\text{C}$	p_{mm}	d_l	d_v
68.95	760		
70	787	0.6122	0.0034
80	1062	0.6022	0.0045
90	1407	0.5918	0.0058
100	1836	0.5814	0.0075
110	2358	0.5703	0.0096
120	2980	0.5588	0.0120
130	3720	0.5467	0.0150
140	4605	0.5343	0.0187
150	5610	0.5207	0.0230
160	6790	0.5063	0.0283
170	8120	0.4913	0.0347
180	9650	0.4751	0.0423
190	10380	0.4570	0.0516
200	13350	0.4365	0.0633
210	15580	0.4124	0.0790
220	18100	0.3810	0.1011
230	20950	0.3329	0.1405
234.8	22500	0.2344	

$$d_m = 0.3388 - 0.034445t; \text{ range, } 0^\circ \text{ to } t_c.$$

$(\text{C}_3\text{H}_7)_2$, DIISOPROPYL (20)

$t, ^\circ\text{C}$	p_{mm}	d_l	d_v
58.1	760		
60	807	0.6243	0.0035
70	1093	0.6144	0.0046
80	1444	0.6039	0.0060
90	1876	0.5931	0.0078
100	2410	0.5821	0.0099
110	3045	0.5708	0.0125
120	3790	0.5589	0.0155
130	4675	0.5464	0.0193
140	5715	0.5334	0.0236
150	6885	0.5199	0.0285
160	8255	0.5049	0.0352
170	9805	0.4885	0.0429
180	11530	0.4705	0.0522
190	13475	0.4508	0.0636
200	15700	0.4274	0.0783
210	18200	0.3988	0.0986
220	21000	0.3565	0.1321
225	22600	0.3198	0.1649
227.35	23350	0.2411	

$$d_m = 0.3401 - 0.034445t + 0.07413t^2; \text{ range, } 0^\circ \text{ to } t_c.$$

C₆H₅CH₃ (1, 6)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>d_l</i>	<i>d_v</i>
190		0.687	0.022
200		0.672	0.026
210		0.658	0.030
220		0.644	0.035
230		0.630	0.040
240		0.614*	0.048
250		0.594	0.057
260		0.574	0.066
270		0.554	0.076
280		0.534	0.085
320.6	41.6		

$d_m = 0.4464 - 0.03483t$; range, 190° to t_c .

***n*-C₇H₁₆ (20)**

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
98.4	760		
100	795	0.6124	0.0036
110	1047	0.6027	0.0047
120	1367	0.5926	0.0061
130	1753	0.5821	0.0078
140	2229	0.5711	0.0098
150	2785	0.5598	0.0122
160	3450	0.5481	0.0151
170	4210	0.5359	0.0185
180	5090	0.5232	0.0224
190	6095	0.5066	0.0271
200	7260	0.4952	0.0330
210	8595	0.4793	0.0401
220	10110	0.4616	0.0489
230	11810	0.4414	0.0600
240	13790	0.4177	0.0745
250	15980	0.3882	0.0954
260	18470	0.3457	0.1287
266.85	20400	0.2341	

$d_m = 0.3504 - 0.034102t - 0.07621t^2$; range, 0° to t_c .

***o*-C₆H₄(CH₃)₂ (6)**

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
190		0.716	0.014
200		0.705	0.016
210		0.694	0.019
220		0.682	0.021
230		0.670	0.024
240		0.656	0.028
250		0.641	0.034
260		0.625	0.040
270		0.609	0.046
280		0.593	0.052

$d_m = 0.4578 - 0.03481t$; range, 190° to t_c .

***m*-C₆H₄(CH₃)₂ (6)**

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
190		0.690	0.020
200		0.678	0.023
210		0.666	0.026
220		0.654	0.030
230		0.642	0.034
240		0.629	0.038
250		0.615	0.043

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
260		0.600	0.048
270		0.585	0.054
280		0.570	0.060

$d_m = 0.4385 - 0.03438t$; range, 190° to t_c .

***p*-C₆H₄(CH₃)₂ (6)**

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
190		0.620	0.028
200		0.612	0.030
210		0.603	0.032
220		0.594	0.035
230		0.585	0.038
240		0.575	0.041
250		0.562	0.045
260		0.548	0.051
270		0.534	0.057
280		0.520	0.062

$d_m = 0.3902 - 0.03344t$; range, 190° to t_c .

***n*-C₈H₁₈ (20)**

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
125.8	760		
130	859	0.6071	0.0042
140	1114	0.5973	0.0054
150	1425	0.5875	0.0068
160	1807	0.5772	0.0085
170	2255	0.5667	0.0107
180	2775	0.5556	0.0132
190	3385	0.5441	0.0161
200	4100	0.5317	0.0196
210	4925	0.5189	0.0236
220	5875	0.5053	0.0287
230	6950	0.4901	0.0348
240	8200	0.4732	0.0424
250	9600	0.4554	0.0512
260	11180	0.4364	0.0622
270	12980	0.4123	0.0772
280	15000	0.3818	0.0983
290	17150	0.3365	0.1346
296.2	18700	0.2327	

$d_m = 0.3592 - 0.033986t - 0.07960t^2$; range, 0° to t_c .

(C₄H₉)₂, DIISOBUTYL (20)

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
109.2	760		
110	777	0.6143	0.0040
120	1020	0.6046	0.0052
130	1320	0.5945	0.0067
140	1685	0.5841	0.0085
150	2115	0.5732	0.0107
160	2645	0.5620	0.0132
170	3245	0.5503	0.0161
180	3940	0.5383	0.0196
190	4740	0.5255	0.0237
200	5670	0.5117	0.0287
210	6730	0.4970	0.0348
220	7940	0.4810	0.0420
230	9310	0.4633	0.0509
240	10900	0.4434	0.0622
250	12670	0.4199	0.0768

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
260	14650	0.3912	0.0970
270	16900	0.3482	0.1321
276.8	18650	0.2366	

$d_m = 0.3550 - 0.034115t - 0.07592t^2$; range, 0° to t_c .

HALOGEN DERIVATIVES**CH₃CL AND C₂H₅CL, *v. p.* 231**

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
-78.2	760	30	32750
0	14700	40	40500
+10	20090	44.9	47100
20	25600		

C₆H₅F (20)

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
85.2	760		
90	883	0.9366	0.0038
100	1177	0.9233	0.0050
110	1542	0.9096	0.0065
120	1950	0.8955	0.0083
130	2530	0.8811	0.0105
140	3170	0.8665	0.0131
150	3930	0.8519	0.0163
160	4825	0.8363	0.0199
170	5840	0.8203	0.0241
180	7010	0.8037	0.0291
190	8375	0.7857	0.0350
200	9900	0.7671	0.0418
210	11615	0.7480	0.0497
220	13550	0.7265	0.0591
230	15725	0.7036	0.0704
240	18160	0.6789	0.0840
250	20900	0.6504	0.1008
260	23950	0.6163	0.1226
270	27350	0.5739	0.1535
280	31200	0.5133	0.2034
286.5	33900	0.3541	

$d_m = 0.5236 - 0.036000t + 0.07293t^2$; range, 0° to t_c .

CCl₄ (20)

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
76.75	760		
80	838	1.4765	0.0061
90	1112	1.4554	0.0080
100	1457	1.4343	0.0103
110	1880	1.4124	0.0131
120	2390	1.3902	0.0164
130	3000	1.3680	0.0204
140	3725	1.3450	0.0250
150	4555	1.3215	0.0304
160	5535	1.2983	0.0365
170	6640	1.2734	0.0437
180	7900	1.2470	0.0525
190	9315	1.2192	0.0625
200	10940	1.1888	0.0742
210	12760	1.1566	0.0879
220	14800	1.1227	0.1040
230	17060	1.0857	0.1232
240	19600	1.0444	0.1464
250	22410	0.9980	0.1754

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
260	25530	0.9409	0.2146
270	29000	0.8666	0.2710
280	32800	0.7634	0.3597
283.15	34200	0.5576	

$d_m = 0.8165 - 0.039564t + 0.06148t^2$; range, 0° to t_c .

CHCl₃ (5, 15, 20)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
61.2	760	130	4860
90	1880	140	5950
100	2430	150	7080
110	3100	160	8800
120	3890		

$d_m = 0.546 - 0.0009(t - 230)$; range, 230° to t_c . For d_l and d_v to 4 decimals between 195° and t_c , see (5). $d_c = 0.516$ at $t_c = 262.9^\circ$.

***n*-C₃H₇CL (2, 18)**

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
46.65	760	140	8500
50	859	150	10200
60	1233	160	12100
70	1680	170	14450
80	2210	180	16900
90	2870	190	19600
100	3670	200	22650
110	4600	210	25050
120	5700	220	29700
130	7000	230.05	34370

C₆H₅CL (20)

<i>t</i> , °C	<i>p</i> _{mm}	<i>d_l</i>	<i>d_v</i>
132	760		
140	939.5	0.9723	0.0043
150	1206	0.9599	0.0054
160	1535	0.9480	0.0068
170	1920	0.9354	0.0084
180	2370	0.9224	0.0102
190	2900	0.9091	0.0125
200	3520	0.8955	0.0151
210	4230	0.8815	0.0181
220	5055	0.8672	0.0214
230	5990	0.8518	0.0254
240	7050	0.8356	0.0300
250	8270	0.8196	0.0354
260	9650	0.8016	0.0417
270	11190	0.7834	0.0492
359.2	33900	0.3654	

$d_m = 0.5640 - 0.035337t + 0.07509t^2$; range, 0° to t_c .

C₂H₅Br (5, 15, 20)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
38.4	760	90	3420
40	794	100	4330
50	1110	110	5400
60	1500	120	6650
70	2010	130	8100
80	2630		

$d_m = 0.521 - 0.040 (t - 210)$; range, 210° to t_c . For d_l and d_v to 3 decimals, 195° to t_c , see (5). $d_c = 0.513$ at $t_c = 230.9^\circ$.

C₆H₅Br (16, 20)

$t, ^\circ\text{C}$	p_{mm}	d_l	d_v
156.15	760		
160	846	1.2994	0.0052
170	1077	1.2847	0.0066
180	1350	1.2697	0.0081
190	1685	1.2534	0.0099
200	2075	1.2385	0.0121
210	2525	1.2210	0.0146
220	3055	1.2037	0.0174
230	3660	1.1876	0.0208
240	4360	1.1689	0.0248
250	5160	1.1510	0.0293
260	6080	1.1310	0.0343
270	7105	1.1099	0.0402
397	3390 ₀	0.4859	

$d_m = 0.7609 - 0.036655t - 0.07725t^2$; range, 0° to t_c .

C₆H₅I (20)

$t, ^\circ\text{C}$	p_{mm}	d_l	d_v
188.45	760		
190	793	1.5639	0.0059
200	991	1.5470	0.0073
210	1232	1.5297	0.0089
220	1520	1.5124	0.0108
230	1855	1.4941	0.0130
240	2245	1.4764	0.0156
250	2700	1.4581	0.0185
260	3220	1.4384	0.0220
270	3815	1.4190	0.0260
448	3390 ₀	0.5814	

$d_m = 0.9303 - 0.037556t + 0.07519t^2$; range, 0° to t_c .

LITERATURE

(For a key to the periodicals see end of volume)

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CORRECTION OF BOILING POINTS TO NORMAL ATMOSPHERIC PRESSURE

C. S. CRAGOE

This correction can be made most accurately and conveniently by means of the following equation:

$$\Delta t = \frac{273.1 + t}{\Phi} (2.8808 - \log_{10} p_{\text{mm}}) \quad (1)$$

where Δt is the correction in degrees centigrade which must be added to the boiling point, t , determined at the pressure, p , mm of mercury, in order to obtain the normal boiling point.

Equation (1) is merely another way of writing

$$\log_{10} p_{\text{mm}} = -A/T + B \quad (2)$$

which is known to express vapor-pressure data accurately over a considerable range. For the range near the normal boiling point, T_B , equation (2) may be written in the form

$$\log_{10} \frac{p_{\text{mm}}}{760} = \Phi \left(1 - \frac{T_B}{T} \right) \quad (3)$$

where Φ in equations (1) and (3) is related to A and B in equation (2) by

$$\Phi = B - 2.8808 = \frac{0.05223 A \text{ (joule)}}{T_B} = \frac{0.2186 A \text{ (calorie)}}{T_B}$$

where A is the molal heat of vaporization at the normal boiling point.

For small pressure differences, equation (1) reduces to Craft's equation: $\Delta t = C T_B (760 - p)$; where $C = \frac{5.714 \times 10^{-4}}{\Phi}$.

In accordance with Trouton's rule and also Craft's rule, Φ is roughly constant for most substances and approximately constant for substances of a given class. Values of Φ are given in Tables 1, 2 and 3 and Fig. 1 for pressures near the normal boiling point. The compounds or classes of compounds given in Table 3 have been divided, for convenience, into eight groups, the values of Φ for each group being represented within about 2% by the lines indicated in Fig. 1.

To obtain a value of Φ for a substance, X , which is not listed in Tables 1, 2, or 3, proceed as follows:

(a) *Elementary Substances*.—Graph values of Φ given in Table 1 for elements in the column to which X belongs, against their normal boiling points (*v. Vol. I*, p. 102) and interpolate or extrapolate to approximate normal boiling point of X .

(b) T_B , 400 to 2250 C.—Estimate Φ as well as possible from the values given in Table 2 or by moderate extrapolation from Fig. 1 to the normal boiling point of X .

(c) T_B , -200 to +400°C.—Determine the probable group by selection of compounds in Table 3 most analogous to X in constitution and obtain value of Φ for that group from Fig. 1 at approximate normal boiling point of X .

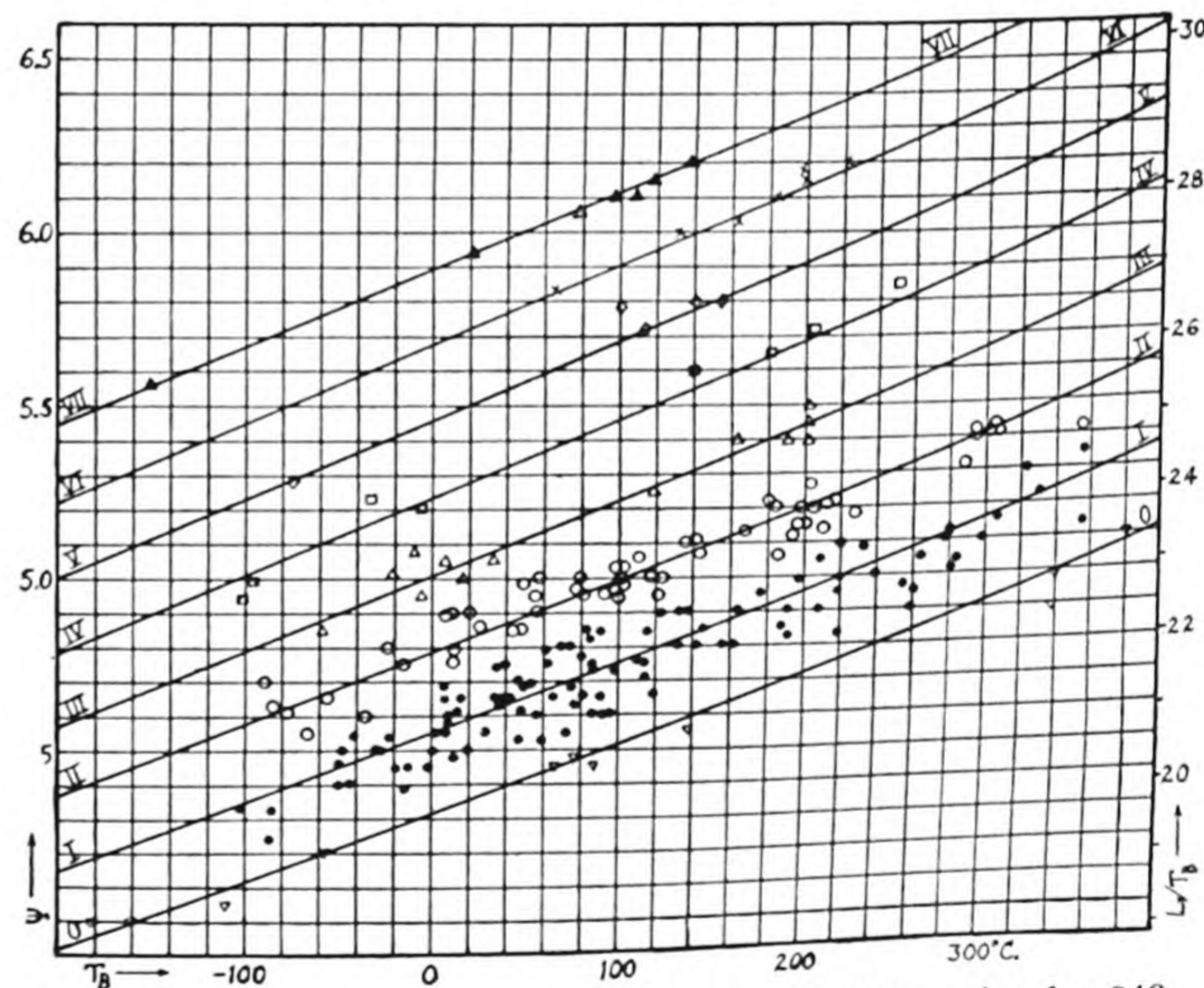


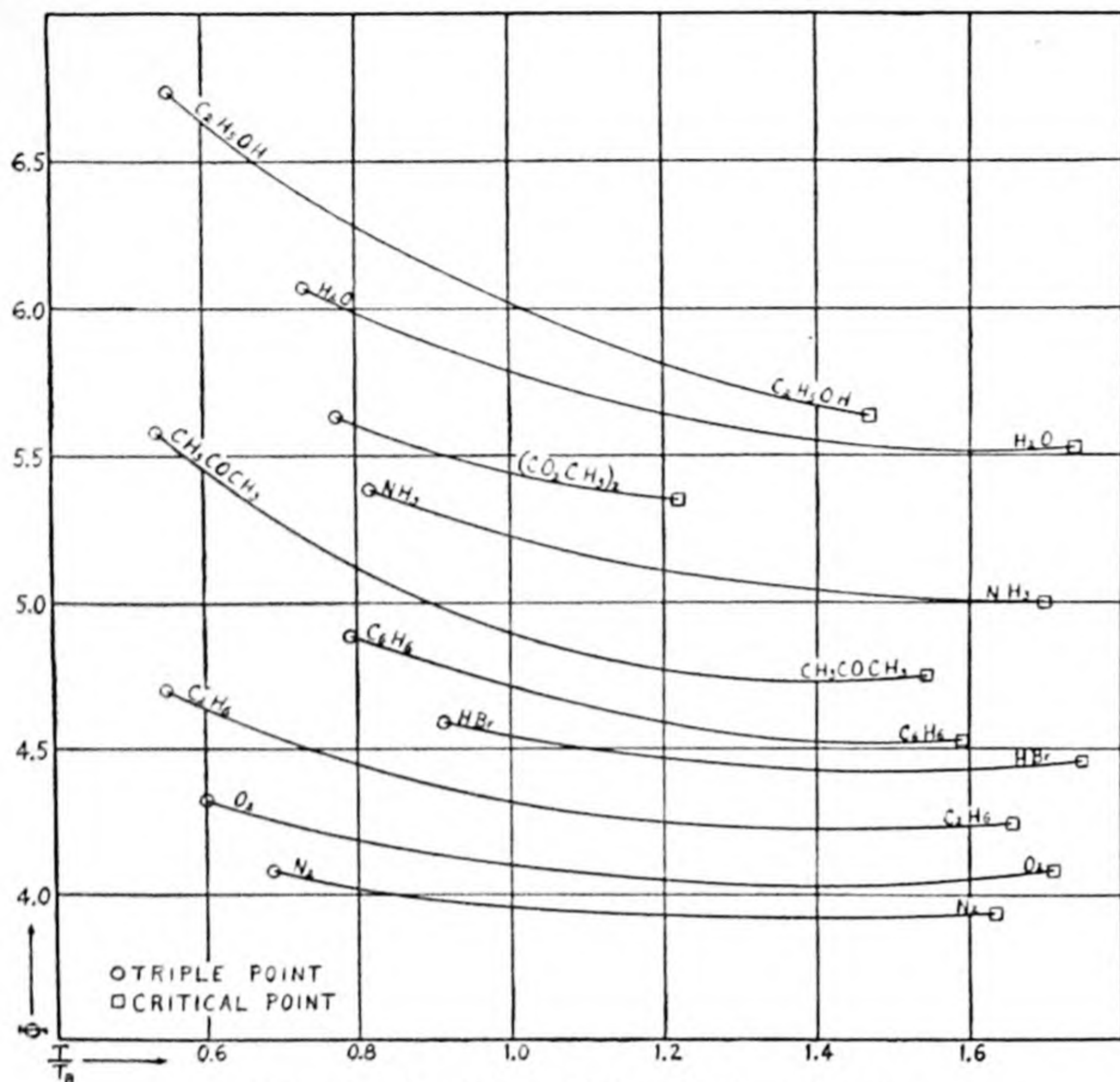
FIG. 1.—Entropy of vaporization at normal boiling point for 240 organic and inorganic compounds. (Roman numerals indicate groups listed in Table 3.)

It should be noted that the higher members of a series of compounds are usually in the same group and, almost without exception, the first (and frequently the second and third) member of the series is in a different group.

Wide extrapolations can be made with moderate accuracy since Φ changes only slightly over the entire range from the triple point to the critical point as is illustrated by the typical curves of Fig. 2.

Example.—The vapor pressure of benzene at 20°C is found to be 75.0 mm. What is its normal boiling point? Table 3 indicates this compound is in Group I. Figure 1 gives $\Phi = 4.60$ at 20°C for

Group I. Substituting this value in equation (1) gives $\Delta t = 64.1^\circ$ or $t_B = 84.1^\circ\text{C}$ as a first approximation. Figure 1 gives values of Φ for $T/T_B = 1.0$, or $\Phi = 4.73$ at 84° for Group I. The typical curves in Fig. 2 indicate that Φ is greater at $T/T_B = 293.1/357.2 = 0.82$ by about 3%, yielding $\Phi = 4.87$. Substituting this value in equation (1), $\Delta t = 60.5^\circ$ or $t_B = 80.5^\circ\text{C}$ as a second approximation.

FIG. 2.—Variation of Φ with temperature.TABLE 1.— Φ FOR ELEMENTARY SUBSTANCES

Figures in parentheses denote extrapolations beyond experimental range

0	I	II	III	IV	V	VI	VII	
He 1.70	H 2.61			C (6.7)	N 3.96	O 4.08		
Ne 3.54					P 4.70	S 4.515	Cl 4.60	
A 4.18	Na 4.6	Mg 10.1					Mn 6.42	Fe (4.6)
	K 4.3	Ca (13.3)					Br 4.74	
Kr 4.04	Cu 9.5	Zn 5.23				Se 4.80		
	Rb (4.1)	Sr (13.1)						
	Ag 5.9	Cd 5.02		Sn (6.7)	Sb 6.17		I 5.06	
	Cs (4.0)	Ba (12.9)						
Rn 4.34	Au (7.0)	Hg 4.925		Pb (4.9)	Bi (6.0)			

TABLE 2.— Φ FOR COMPOUNDS WITH NORMAL BOILING POINTS BETWEEN 400 AND 2250°C

2.5	Cu ₂ Cl ₂ ; Cu ₂ Br ₂ ; Cu ₂ I ₂
3.6	As ₂ O ₃
4.1–4.6	NaOH; KOH; NaCN
4.8–5.5	Halides (13) of Li, Na, K, Rb, Cs, Pb, and Tl (except those given below)
5.6–6.0	LiF; NaF; NaCl; RbF
6.0–6.4	KF; CsI; RbCl; PbCl ₂
10.5	SiO ₂

TABLE 3.—COMPOUNDS WITH NORMAL BOILING POINTS BETWEEN -200 AND +400°C

Figures in parentheses denote number of compounds of that class

Inorganic	Organic	
	Group 0	
SiH ₄	Methane	Butylethylene
S ₂ Cl ₂	Carbon monoxide	Anthracene
Co(CO) ₈ NO	Methylsilane	Phenanthrene
	Trichloroethylene	Anthraquinone
	Group I	
HF; PH ₃	Hydrocarbons (34)	Benzonitrile
H ₂ Se; H ₂ Te	C _a H _b X _c * (30)	Benzaldehyde
Si ₂ H ₆ ; Si ₃ H ₈	Ethers (5)	Phthalic anhydride
Ge ₂ H ₆ ; Ge ₃ H ₈	C _a H _b S* (4)	Methyl salicylate
SnH ₄	COS; CS ₂	Quinoline
H _a X _b Y _c * (17)	C ₃ O ₂ ; COCl ₂	Camphor
Si ₂ OCl ₆	Dimethylsilane	Benzophenone
SeOCl ₂	<i>o</i> , <i>m</i> , <i>p</i> -Nitrotoluidines	Methyl ethyl ketone
CrO ₂ Cl ₂	<i>o</i> , <i>m</i> , <i>p</i> -Nitrotoluenes	Dibenzyl ketone
	Group II	
HCl; HBr; HI	Esters (17)	Acetone
ClO ₂ ; N ₂ O	Amines (14)	Methyl ether
AsH ₃	HCN; CNCl	Methyl ethyl ether
(SiH ₃) ₂ O; (SiCl ₃) ₂ O	CH ₃ F; CH ₃ NO ₂	Nitrobenzene
Si ₃ H ₈ N; (SiH ₃) ₃ N	Tetranitromethane	<i>o</i> , <i>m</i> -Chloroanilines
HgCl ₂	Formic acid	Methyl benzoate
	Ethylene oxide	α , β -Naphthols
	Acetaldehyde	
	Group III	
SO ₂	Acetic acid	Dimethyl oxalate
H ₂ S	Cyanogen	<i>o</i> , <i>m</i> , <i>p</i> -Cresols
NOCl	Methyl formate	Acetophenone
	Glycol diacetate	Dimethylamine
		Ethylamine
	Group IV	
NH ₃	Methylamine	Benzyl alcohol
PF ₃	Propionic acid	Benzoic acid
BF ₃	Phenol	
	Group V	
H ₂ O	Acetic anhydride	
N ₂ H ₄	Isobutyric acid	
PF ₅		
	Group VI	
	Methyl alcohol	Butyric acid
	Isoamyl alcohol	Valeric acid
	Glycol	Isocaproic acid
		Heptylic acid
	Group VII	
NO; N ₂ O ₄	Ethyl alcohol	
HgCl	<i>n</i> -Propyl alcohol	
	Isobutyl alcohol	
	<i>n</i> -Amyl alcohol	

* $a = 0, 1, 2, 3$, etc.; b and $c = 1, 2, 3$, etc.; X = Halogen; Y = P, As, Sb, Si, Ge, Sn, Hg, Os, or B.

CRITICAL-POINT DATA

A. F. O. GERMAN AND S. F. PICKERING

In the following tables the values, for which no literature reference is given, have been compiled from the vapor pressure and orthobaric density sections of this volume, *q. v.* for the literature citations.

A-TABLE, ELEMENTARY SUBSTANCES AND ATMOSPHERIC AIR

Formula	t_c , °C	p_c , atm.	d_c , g/cm ³	Lit.
A.....	- 122	48	0.531	(21)
Br ₂	302			
Cl ₂	144.0	76.1	0.573	(21)
H ₂	- 239.9	12.8	0.0310	(21)
He.....	- 267.9	2.26	0.0693	(21)
Hg.....	>1550	>200	4-5	
I ₂	553			
Kr.....	- 63	54	0.78	(21)
N ₂	- 147.1	33.5	0.3110	(21)
Ne.....	- 228.7	25.9	0.484	(21)
O ₂	- 118.8	49.7	0.430	(21)
Rn.....	104	62		
S.....	1040			
Xe.....	16.6	58.2	1.155	(21)
Air.....	- 140.7	37.2	0.35*	(21)
			0.31†	

* Plait point.

† Critical point of contact.

B-TABLE, CHEMICAL COMPOUNDS

Formula	t_c , °C	p_c , atm.	d_c , g/cm ³	Lit.
H ₂ O.....	374.0	217.72	0.4	
HCl.....	51.4	81.6	0.42	(21)
HBr.....	90	84		(21)
HI.....	151	82		(21)
SO ₂	157.2	77.7	0.52	(21)
SO ₃	218.3	83.6	0.630	
H ₂ S.....	100.4	88.9		(21)
H ₂ Se.....	138	88		
N ₂ O.....	36.5	71.7	0.45	(21)
NO.....	-94	65	0.52	(21)
N ₂ O ₄	158	99		
NH ₃	132.4	111.5	0.235	(21)
N ₂ H ₄	380	145		
PH ₃	51	64	0.30	
PH ₄ Cl.....	49	73		
SiH ₄	- 3.5	48		
SiF ₄	- 1.5	50		
GeCl ₄	277	38		
SnCl ₄	318.7	37.0	0.742	

C-TABLE, CARBON COMPOUNDS

Formula	Name	t_c , °C	p_c , atm.	d_c , g/cm ³	Lit.
CCl ₂ O	Phosgene.....	182	56	0.52	(7, 9, 17)
CCl ₄	Carbon tetrachloride.....	283.1	45.0	0.558	
CO	Carbon monoxide.....	- 139	35	0.311	(21)
COS	Carbon oxysulfide.....	105	61		
CO ₂	Carbon dioxide.....	31.1	73.0	0.460	(21)
CS ₂	Carbon disulfide.....	273	76		
CHCl ₃	Chloroform.....	263		0.516	
HCN	Hydrogen cyanide.....	183.5	50	0.20	
CH ₃ Cl	Methyl chloride.....	143.1	65.8	0.37	(21)
CH ₃ F	Methyl fluoride.....	44.9	62.0		
CH ₄	Methane.....	- 82.5	45.8	0.162	(21)
CH ₄ O	Methyl alcohol.....	240.0	78.7	0.272	(27, 33)
CH ₄ S	Methylmercaptan.....	196.8	71.4	0.323	(2)
CH ₅ N	Methylamine.....	156.9	73.6		(1)
C ₂ N ₂	Cyanogen.....	128	59		(21)

Formula	Name	t_c , °C	p_c , atm.	d_c , g/cm ³	Lit.
C ₂ H ₂	Acetylene.....	36	62	0.231	(21)
C ₂ H ₃ N	Acetonitrile.....	274.7	47.7	0.240	(8, 29)
C ₂ H ₄	Ethylene.....	9.7	50.9	0.22	(21)
C ₂ H ₄ O	Acetaldehyde.....	188			(13)
C ₂ H ₄ O	Ethylene oxide.....	192.0			(14)
C ₂ H ₄ O ₂	Acetic acid.....	321.6	57.2	0.351	(23, 24, 34)
C ₂ H ₄ O ₂	Methyl formate.....	214.0	59.15	0.349	(34, 35)
C ₂ H ₅ Br	Ethyl bromide.....	231		0.513	
C ₂ H ₅ Cl	Ethyl chloride.....	187.2	52	0.33	(21)
C ₂ H ₆	Ethane.....	32.1	48.8	0.21	(21)
C ₂ H ₆ O	Ethyl alcohol.....	243.1	63.1	0.2755	(25, 33)
C ₂ H ₆ O	Methyl ether.....	126.9	52.0	0.271	(4, 5)
C ₂ H ₆ S	Methyl sulfide.....	229.9	54.6	0.306	(2)
C ₂ H ₆ S	Ethylmercaptan.....	225.5	54.2	0.301	(2)
C ₂ H ₇ N	Dimethylamine.....	164.6	51.7		(1)
C ₂ H ₇ N	Ethylamine.....	183.2	55.5		(1)
C ₃ H ₄	Allylene CH ₃ C:CH.....	128			(21)
C ₃ H ₅ ClO ₂	Ethyl chloroformate.....	<235			(8)
C ₃ H ₅ N	Propionitrile.....	291.2	41.3	0.241	(29)
C ₃ H ₆	Propylene CH ₃ CH:CH ₂	92.3	45.0		(21)
C ₃ H ₆ O	Acetone.....	235.0	47	0.268	(11)
C ₃ H ₆ O	Allyl alcohol.....	272			(15)
C ₃ H ₆ O ₂	Ethyl formate.....	235.3	46.65	0.323	(34, 35)
C ₃ H ₆ O ₂	Methyl acetate.....	233.7	46.3	0.325	(34, 35)
C ₃ H ₆ O ₂	Propionic acid.....	339.5	53.0	0.315	(12, 19, 30)
C ₃ H ₇ Cl	<i>n</i> -Propyl chloride.....	230	45.2		
C ₃ H ₈	<i>n</i> -Propane.....	95.6	43		(21)
C ₃ H ₈ O	<i>n</i> -Propyl alcohol.....	263.7	49.95	0.273	(28, 33)
C ₃ H ₈ O	Isopropyl alcohol.....	235	53		(15)
C ₃ H ₈ O	Methyl ethyl ether.....	164.7	43.4	0.270	(2)
C ₃ H ₈ O ₂	Methylal.....	224			(19)
C ₃ H ₈ S	Methyl ethyl sulfide.....	260	42		(30)
C ₃ H ₉ N	Trimethylamine.....	161	41		(31)
C ₃ H ₉ N	Propylamine.....	223.8	46.3		(1)
C ₄ H ₄ S	Thiophene.....	317	48		(20)
C ₄ H ₆ O ₃	Acetic anhydride.....	296	46		(30)
C ₄ H ₆ O ₄	Methyl oxalate.....	260	9.48		
C ₄ H ₇ N	Butyronitrile.....	309	37.4		(8)
C ₄ H ₈ O ₂	Methyl propionate.....	257.4	39.3	0.312	(34, 35)
C ₄ H ₈ O ₂	Ethyl acetate.....	250.1	37.8	0.308	(34, 35)
C ₄ H ₈ O ₂	Propyl formate.....	264.85	40.1	0.309	(34, 35)
C ₄ H ₈ O ₂	<i>n</i> -Butyric acid.....	355		0.302	(3, 12)
C ₄ H ₈ O ₂	Isobutyric acid.....	336		0.304	(3, 12)
C ₄ H ₁₀	<i>n</i> -Butane.....	153	36		(21)
C ₄ H ₁₀	Isobutane.....	134	37		(21)
C ₄ H ₁₀ O	Ethyl ether.....	193.8	35.5	0.2625	(26, 34)
C ₄ H ₁₀ O	<i>n</i> -Butyl alcohol.....	287	48.4		(11, 19)
C ₄ H ₁₀ O	Isobutyl alcohol.....	265	48		(15)
C ₄ H ₁₀ O	<i>sec.</i> -Butyl alcohol.....	265			(3)
C ₄ H ₁₀ O	<i>tert.</i> -Butyl alcohol.....	235			(19)
C ₄ H ₁₀ S	Ethyl sulfide.....	283.8	39.1	0.279	(2)
C ₄ H ₁₀ S ₂	Ethyl disulfide.....	369			(6)
C ₄ H ₁₁ N	Diethylamine.....	223.5	36.2	0.246	(1, 11)
C ₅ H ₅ N	Pyridine.....	344	60.0		(8, 11)
C ₅ H ₁₀ O	Ethyl allyl ether.....	245			(19)
C ₅ H ₁₀ O ₂	Ethyl propionate.....	272.9	33.0	0.2965	(34, 35)
C ₅ H ₁₀ O ₂	Isobutyl formate.....	278	38	0.288	(16)
C ₅ H ₁₀ O ₂	Methyl butyrate.....	281.3	34.2	0.300	(34, 35)
C ₅ H ₁₀ O ₂	Methyl isobutyrate.....	267.55	33.7	0.301	(34, 35)
C ₅ H ₁₀ O ₂	Propyl acetate.....	276.2	32.9	0.296	(34, 35)
C ₅ H ₁₀ O ₂	<i>n</i> -Valeric acid.....	379			(3)
C ₅ H ₁₀ O ₂	Isovaleric acid.....	361			(3)
C ₅ H ₁₂	<i>n</i> -Pentane.....	197.2	33.0	0.232	
C ₅ H ₁₂	Isopentane.....	187.8	32.8	0.234	
C ₅ H ₁₂ O	Ethyl propyl ether.....	227.4	32.1	0.258	(2)
C ₅ H ₁₂ O	Isoamyl alcohol.....	307			(19)
C ₅ H ₁₂ O	<i>tert.</i> -Amyl alcohol.....	272			(3)
C ₅ H ₁₂ O ₂	Methylene diethyl ether.....	254			(19)
C ₅ H ₁₂ S	Isoamylmercaptan.....	321			(6)
C ₆ H ₅ Br	Bromobenzene.....	397	44.6	0.486	
C ₆ H ₅ Cl	Chlorobenzene.....	359	44.6	0.365	
C ₆ H ₅ F	Fluorobenzene.....	286	44.6	0.354	
C ₆ H ₅ I	Iodobenzene.....	448	44.6	0.581	
C ₆ H ₆	Benzene.....	288.5	47.7	0.304	

Formula	Name	t_c , °C	p_c , atm.	d_c , g/cm ³	Lit.
C ₆ H ₆ O	Phenol.....	419	60.5		(8, 11)
C ₆ H ₇ N	Aniline.....	426	52.4		(8)
C ₆ H ₁₀ O ₂	Ethyl crotonate.....	326			(19)
C ₆ H ₁₀ S	Allyl sulfide.....	380			(6)
C ₆ H ₁₁ N	Capronitrile.....	349	32.2		(8)
C ₆ H ₁₂	Cyclohexane.....	281.0	40.4	0.270	
C ₆ H ₁₂ O ₂	<i>n</i> -Butyl acetate.....	306			(18)
C ₆ H ₁₂ O ₂	Ethyl butyrate.....	293	30	0.276	(16)
C ₆ H ₁₂ O ₂	Ethyl isobutyrate.....	280	30	0.276	(16)
C ₆ H ₁₂ O ₂	Isoamyl formate.....	303	34	0.282	(16)
C ₆ H ₁₂ O ₂	Isobutyl acetate.....	288	31	0.281	(16)
C ₆ H ₁₂ O ₂	Methyl valerate.....	294 d	32	0.279	(8, 16, 22)
C ₆ H ₁₂ O ₂	Propyl propionate.....	305			(18)
C ₆ H ₁₂ O ₃	Paraldehyde.....	290			(13)
C ₆ H ₁₄	Diisopropyl.....	227.4	30.6	0.241	
C ₆ H ₁₄	<i>n</i> -Hexane.....	234.8	29.5	0.234	
C ₆ H ₁₅ N	Triethylamine.....	262	30	0.251	(11, 32)
C ₆ H ₁₅ N	Dipropylamine.....	277	31		(32)
C ₇ H ₅ N	Benzonitrile.....	426	41.6		(8)
C ₇ H ₈	Toluene.....	320.6	41.6	0.292	
C ₇ H ₈ O	<i>o</i> -Cresol.....	422	49.4		(8, 11, 22)
C ₇ H ₈ O	<i>m</i> -Cresol.....	432	45.0		(8)
C ₇ H ₈ O	<i>p</i> -Cresol.....	426	50.8		(8, 11, 22)
C ₇ H ₈ O	Anisole.....	369	41.3		(8)
C ₇ H ₉ N	Methylaniline.....	429	51.3		(8, 11, 22)
C ₇ H ₁₄ O ₂	Isoamyl acetate.....	326			(3)
C ₇ H ₁₄ O ₂	Isobutyl propionate.....	319			(18)
C ₇ H ₁₄ O ₂	Ethyl isovalerate.....	315			(3)
C ₇ H ₁₄ O ₂	Ethyl valerate.....	297			(10)
C ₇ H ₁₄ O ₂	Propyl butyrate.....	327			(18)
C ₇ H ₁₄ O ₂	Propyl isobutyrate.....	316			(18)
C ₇ H ₁₆	<i>n</i> -Heptane.....	266.8	26.8	0.234	
C ₇ H ₁₆ O	<i>n</i> -Heptyl alcohol.....	365			(3)
C ₈ H ₇ N	Tolunitrile.....	450			(8, 22)
C ₈ H ₁₀ O	Phenetole.....	374	33.8		(8)
C ₈ H ₁₁ N	Dimethylaniline.....	415	35.8		(8)
C ₈ H ₁₆ O ₂	Isoamyl propionate.....	338			(3)
C ₈ H ₁₆ O ₂	Isobutyl butyrate.....	338			(3)
C ₈ H ₁₆ O ₂	Isobutyl isobutyrate.....	329			(3)

Formula	Name	t_c , °C	p_c , atm.	d_c , g/cm ³	Lit.
C ₈ H ₁₆ O ₂	Propyl isovalerate.....	336			(3)
C ₈ H ₁₈	Diisobutyl.....	277	24.5	0.237	
C ₈ H ₁₈	<i>n</i> -Octane.....	296	24.6	0.234	
C ₈ H ₁₈ O	<i>n</i> -Octyl alcohol.....	385			(3)
C ₈ H ₁₈ O	<i>sec.</i> -Octyl alcohol.....	364			(3)
C ₉ H ₇ N	Quinoline.....	> 520			(8, 22)
C ₉ H ₁₃ N	Dimethyl- <i>o</i> -toluidine.....	395	30.8		(8)
C ₉ H ₁₅ O ₂	Isoamyl butyrate.....	346			(3)
C ₉ H ₁₅ O ₂	Isobutyl isovalerate.....	348			(3)
C ₁₀ H ₁₄ O	Thymol.....	425			(8, 22)
C ₁₀ H ₂₀ O ₂	Ethyl caprylate.....	386			(3)
C ₁₀ H ₂₂ S	Isoamyl sulfide.....	391			(6)
C ₁₁ H ₂₂ O ₂	Ethyl nonylate.....	400			(3)

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ADSORPTION AT SOLID SURFACES AND SOLUBILITY OF GASES IN METALS OF THE PLATINUM GROUP

E. K. RIDEAL

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Phenol from ethyl alcohol, on animal charcoal (36)

x , g/g...	+0.14	+0.185	+0.205	+0.21	+0.202	+0.175	+0.11
c , g solute per g solution...	0.1	0.2	0.3	0.4	0.5	0.6	0.7

STRONG ELECTROLYTES

Approximate values of exponent n in the equation $x = ac^{1/n}$ are indicated thus (n).

Literature.—Methylene blue hydrochloride (73). NaAuCl₄ (54). K₂Cr₂O₇ by bone charcoal ($n = 2$) (63).

Adsorption, positive and negative, of KCl, NH₄Cl, MgSO₄, BaCl₂, CuSO₄ from aqueous solutions; 5 g charcoal at 25°C (99).

c = millimols/l, x = mg adsorbed

KCl	c	0.44	2.66	6.16	20.5	39.8	56.3	68.0
	x	+0.32	+1.25	+2.30	+2.50	+1.10	+1.70	-1.70
c	72.1	101	128	170	NH ₄ Cl	12.2	22.9	48.9
x	-1.80	-1.20	-2.6	-7.7		+1.5	+3.4	+11.9
c	152	191	MgSO ₄	0.43	1.23	25.7	51.6	52.8
x	+4.5	+3.3		+0.89	+2.4	-4.4	-14	-16
c	100.1	153.8	BaCl ₂	95	153	220	CuSO ₄	67
x	-34	-39		+26	+28	+36		+33

Salts from solution (76)

Order of Adsorption.—I⁻ > NO₃⁻ > Br⁻ > Cl⁻ > SO₄²⁻. N solutions of the following give % adsorption, KI, 28; KNO₃, 16; KBr, 14; KCl, 7; K₂SO₄, 5.

(87) gives OH⁻ > CNS⁻ > I⁻ > NO₃⁻ > Br⁻ > Cl⁻ > HPO₄²⁻ > SO₄²⁻; H⁺ > Al⁺⁺⁺ > Cu⁺⁺ > Zn⁺⁺ > Mg⁺⁺ > Ca⁺⁺ > NH₄⁺, K⁺, Na⁺.

Uranium salts (27).

Cl⁻ from KCl by blood charcoal at 21° (57); c = Cl⁻, millimol/l; x = millimol/l Cl⁻ adsorbed by 1 g charcoal.

c	7.24	7.36	8.33	9.09	9.34	9.43	9.52
x	0.47	0.46	0.59	0.70	1.2	1.4	1.9

NH₄IO₃, KIO₃, (NH₄)₂CrO₄ in H₂O, KOH aq., and H₂SO₄ aq. (20).

Adsorption on Crystalline Substances

ON AgI; KI FROM AQUEOUS SOLUTION AT 25.4°C (64)

c , mols per 1×10^4	x , millimols per g AgI $\times 10^3$	c , mols per 1×10^4	x , millimols per g AgI $\times 10^3$
1.31	4.6	44.38	9.0
4.10	7.8	56.83	8.5
11.02	8.4	69.26	7.7
18.19	8.7	86.89	5.5
27.01	9.0	94.83	4.0

ON URIC ACID (71)

Bismarck brown		Methyl violet	
c , g/100 cm ³	x , g/100 g	c , g/100 cm ³	x , g/100 g
0.005	0.0070	0.00043	0.068
.008	.0095	.00074	.093
.009	.0120	.00085	.137
.0017	.0115	.00224	.109

ON AS₂S₃ (25)

In the equation, $x/m = ac^{1/n}$, x = millimols adsorbed per g adsorbent, c = concentration in mols per l, range of equilibrium concentrations examined c_1 to c_2 .

Adsorbate	c_1	c_2	a	$1/n$
C ₆ H ₅ NH ₃ Cl.....	0.0012	0.0096	0.079	0.208
<i>p</i> -C ₆ H ₄ ClNH ₃ Cl.....	.0016	.014	.080	.194
New fuchsin.....	.00002	.00137	.229	.1937
NH ₄ Cl.....	.00053	.00204	.0484	.2034
$\frac{1}{2}$ (NH ₄) ₂ SO ₄.....	.00015	.00194	.0421	.1831
UO ₂ (NO ₃) ₂.....	.000221	.00223	.0314	.0769
Morphine-HCl.....	.0009	.0027	.696	.3531

Adsorption of fatty acids on minerals, from aqueous solutions (95).

Adsorption on Glass

Dyes from aqueous solutions (3.5)

c , g/ml $\times 10^6$	1	5	10	50
x , g/cm ² $\times 10^8$	2	8.7	14	40

Adsorption on Gels from Solution

ON FERRIC OXIDE (70)

Chloride ions; x = millimols Cl⁻ adsorbed per 100 cm³ solution containing m g Fe₂O₃; c = millimols Cl⁻ per cm³ solution

m	x	c	m	x	c
1.2960	1.37	0.00257	1.207	1.873	0.00304
0.8640	1.891(?)	0.00194	1.207	1.830	0.00230
0.6483	0.646	0.00169	1.207	1.769	0.00176
0.5190	0.508	0.00144	1.207	1.744	0.00152
0.4321	0.417	0.00127	1.207	1.718	0.00130
0.3245	0.299	0.00110	1.207	1.693	0.00109
0.2595	0.234	0.00093	1.207	1.660	0.00095
0.2162	0.191	0.00079	1.207	1.628	0.00080

ON ALUMINIUM HYDROXIDE

Order of ionic adsorption: ferrocyanide > ferricyanide > oxalate > sulfate > chromate > dithionate > dichromate (96).

From solution (78): Formic, acetic and butyric acids, and I₂ from various solvents; C₆H₅NO₂ from kerosene; CH₃COOH from CS₂.

Invertin on alumina (102)

Dilution	% adsorption	Wt. Al ₂ O ₃
1:400	9	0.186
1:400	19	0.1395
1:20 000	93	0.1395

Adsorption on Fibers

ON WOOL

HCl in H ₂ O (32)		H ₂ SO ₄ in H ₂ O (32)	
x = g acid per 100 g wool	c = % acid in solution	x = g acid per 100 g wool	c = % acid in solution
0.616	0.0077	0.892	0.0021
1.118	.0176	1.658	.0068
1.958	.0608	2.87	.0426
2.38	.1524	3.471	.1305
2.732	.3453	4.456	.3107
3.194	.7361	5.818	.6838
3.465	1.1306	6.97	1.0606

Approximate relationship $\frac{\sqrt[5]{c}}{x} = 0.293$; $\frac{\sqrt[3]{c}}{x} = 0.140$.

Potash alum from aqueous solutions (77)

% potash alum on weight of wool	c , millimols/l		x , millimols/g	
	Al ₂ O ₃	SO ₃	Al ₂ O ₃	SO ₃
5.12	0.137	1.120	0.377	0.068
10.25	0.395	2.550	0.607	0.113
15.37	0.842	4.075	0.597	0.139
20.50	1.362	5.705	0.500	0.153
25.62	1.863	7.305	0.421	0.168
30.75	2.403	9.055	0.303	0.165

ON MERCERIZED COTTON, DIAMINE BLUE (92)

x , mg/g	c , mg/100 cm ³	x , mg/g	c , mg/100 cm ³
6.65	12.7	18.4	91.4
8.4	19.0	20.6	125.8
10.5	26.3	25.2	157.1
12.25	42.75	30.6	241.6
14.8	58.4	36.2	330.6

ON COTTON FIBERS (92)

Orange G at 100°C		Oxamine blue XX		Benzoblue 4B	
x , mg/g	c , mg/300 cm ³	x , mg/g	c , mg/300 cm ³	x , mg/g	c , mg/300 cm ³
1.33	11	1.58	10.25	1.43	15.3
1.97	18.6	2.00	16.5	2.03	21.9
2.23	23.3	2.48	22.55	2.43	30.3
2.80	36.6	3.07	35.8	2.90	48.4
3.23	50.3	3.77	48.7	3.45	66.2
3.97	78.1	14.5	75.5	4.18	103.3
4.53	106.4	16.4	103.6	4.70	141.2
5.00	135	19.7	130.3	5.00	180.0
6.00	207	23.3	201.7	6.73	273.1
7.07	278.8	28.4	271.6	7.28	380.9

ON SILK, PICRIC ACID (31, 48)

x = g acid per 100 g silk	c = % acid in solution	Solution	Nature of silk	Mole ratio, of adsorbed oxide to adsorbed acid
0.14	0.36	SnCl ₄	Raw	155(SnO ₂):1
0.28	0.72		Boiled off	143(SnO ₂):1
1.0	1.0	Basic ferric sulfate	Raw	111(Fe ₂ O ₃):1
2.29	1.71		Boiled off	91(Fe ₂ O ₃):1
3.8	6.19	CrCl ₃	Raw	40(Cr ₂ O ₃):1
5.9	14.1		Boiled off	44(Cr ₂ O ₃):1
7.0	33	Al(CH ₃ COO) ₃	Raw	Al ₂ O ₃ only
			Boiled off	adsorbed

Adsorption on Miscellaneous Materials

 ON CELLULOSE, METHYLENE BLUE FROM H₂O (x/m)² = Kc (30)

 ON STARCH, I₂ FROM H₂O (x/m)⁵ = Kc (56)

 ON SOILS (97); $x/m = ac^{1/n}$

Adsorbent	Solute	a	$1/n$
Garden soil.....	NH ₄ Cl	0.0948	0.039
Garden soil.....	NH ₄ Cl	.131	.424
Nile sediment.....	NH ₄ Cl	.489	.399
Permutite.....	NH ₄ Cl	2.823	.398
Sodium zeolite (Artificial)...	CaCl ₂	2.487	.317
Zeolite.....	LiCl	24.419	.414
"Soil".....	NH ₄ OH	0.0994	.434
"Soil".....	NH ₄ OH	.147	.461
"Soil".....	NH ₄ OH	.054	.386

For a comprehensive discussion of the adsorption behavior of soils and their constituents for gases and for dissolved substances see Anderson and Mattson (1) and the literature cited by them.

ADSORPTION AND SOLUBILITY OF GASES IN METALS OF THE PLATINUM SERIES

 H₂, HYDROGEN

 cm³ (at S. T. P.) adsorbed per 4.269 g Pt black at 25°C (4)

p_{H_2} , mm	1.1	23.5	67.8	162.4	393	577	768
cm ³	6.06	6.63	6.83	6.97	7.12	7.21	7.34
cm ³ (S. T. P.) adsorbed by 1 cm ³ Pd black ($d = 11.4$) at 760 mm (40)							
t , °C.....	-50	-21	0	+20	40	60	80
cm ³	917	887	880	661	735	742	750

 cm³ (at S. T. P.) adsorbed by 1 g of reduced Pd at p , mm Hg (33)

0°C		0°C		0°C	
p , mm	cm ³	p , mm	cm ³	p , mm	cm ³
0.20	0.21	4.10*	3.13	43.8	68.00
1.10	0.85	4.20	57.30	51.9	70.18
2.6	1.27	4.30	62.00	95.7	71.51
3.80	1.87	5.30	63.70	407.0	71.85
	2.21	9.13	65.02	496.6	72.16
4.00	2.77	12.6	66.4	640	72.55

30°C		80°C		160°C	
p , mm	cm ³	p , mm	cm ³	p , mm	cm ³
1.58	0.92	140.1	6.15	1508	53.51
4.0	0.98	131.6	7.43	1541	53.81
7.4	1.31	140.1*	6.15	1577	54.67
12.5	1.97	152	12.09	1657	55.08
15.6	2.44		50.5	2000	58.10
17.8	3.15	157.8	52.6	2434	60.11
18.6	4.00	169.6	55.0	180°C	
18.8*	3.50	171.6	55.4	101	0.97
	7.65	212.6	58.10	336	2.15
	49.40	670.1	68.81	919	4.52
24.8	60.8	160°C		1218	5.82
27.7	62.65	488	3.43	1363	6.42
29.9	63.0	700	4.65	1458	6.98
43.0	65.4	888	5.87	1695	8.45
52.5	66.0	1016	7.56	1733	8.53
109.3	68.2	1153	8.69	1896	11.15
80°C		1244	10.39	1929	32.39
30.1	1.31	1313	12.82	1955*	14.31
46.2	1.75	1320*	21	1960	29.61
78.6	2.43		41	1966	50.20
85.2	2.98		49	1970	51.78
115.4	3.41	1331	46.77	2006	52.53
127.9	4.79	1460	53.50	2130	54.50
135.6	5.23	1463	52.80	2788	56.95

* Unstable range.

 cm³ (at t and p) adsorbed by 1 cm³ Rh black (ppt. by NH₄OH, $d = 12.1$) at $p = 736$ mm Hg (39)

t , °C.....	-20	0	+50	97	200
cm ³	11	260	180	168	174

 cm³ (at t and p) adsorbed by 1 cm³ Ir black (ppt. by NH₄OH, $d = 22.4$) at $p = ca. 740$ mm Hg (40)

°C	cm ³	°C	cm ³	°C	cm ³	°C	cm ³
-20	113	+20	140	0	48	60	67
-12	96	+49	38	+24	132	80	37
0	75	-21	69	40	103	100	0

 Pd alloys saturated with H₂ electrolytically; cm³ (at t and atm. pressure) adsorbed by 1 g of alloy in which the mole fraction of Pd is x_{Pd} (75)

Pd-Cu			Pd-Ag		
x_{Pd}	cm ³		x_{Pd}	cm ³	
	25°	100°		25°	100°
1.0	70.7	61.4	1.0	70.7	61.3
0.95	53.6	48.4	0.8	81.1	72.0
.86	38.4	32.4	0.7	78.2	70.2
.77	31.3	27.4	0.6	43.2	30.1
.73	27.7	22.1	0.52	13.5	10.9
.53	6.3	4.3	0.51	5.9	2.9
.52	3.7	2.0	0.49	0	0
.48	0	0	0.48	0	0
.13	0	0			

 O₂ AND CO

 cm³ (at S. T. P.) adsorbed per 4.269 g Pt black at 25°C (4)

p , mm	O ₂	688	728	CO	770.5
cm ³		4.38	4.96		7.72

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α The Bunsen absorption coefficient. The volume of gas (reduced to 0°C, 760 mm) which, at the temperature of the experiment, is dissolved in one volume of the solvent when the partial pressure of the gas is 760 mm.	α Coefficient d'absorption de Bunsen. C' est le volume de gaz (réduit à 0°C, 760 mm) qui est dissout à la température de l'expérience dans un volume du solvant, lorsque la pression partielle du gaz est de 760 mm.	α Der Bunsen-Absorptionskoeffizient. Dieser ist das Volumen eines Gases (reduziert auf 0°C und 760 mm) welches in einem Volumteil des Lösungsmittels bei der Versuchstemperatur gelöst ist, wenn der Partialdruck des Gases 760 mm beträgt.	α Coefficiente di assorbimento di Bunsen. Volume di gas (a 0°C e 760 mm) che, alla temperatura dell'esperienza, si scioglie in un volume di solvente quando la pressione parziale del gas è di 760 mm.	
β The same as α , except that the total pressure is 760 mm.	β Le même que α , excepté que la pression totale est de 760 mm.	β So wie α nur ist der Totaldruck 760 mm.	β Lo stesso coefficiente α , con la differenza che la pressione totale è di 760 mm.	
γ The Kuenen absorption coefficient. The same as α , except that the amount of the solvent is one g.	γ Coefficient d'absorption de Kuenen. Le même que α , excepté que la quantité du solvant est un gramme.	γ Der Kuenen-Absorptionskoeffizient. Dieser ist gleich α nur beträgt die Menge des Lösungsmittels 1 Gramm.	γ Coefficiente di assorbimento di Kuenen. Lo stesso coefficiente α riferito però ad un g di solvente.	
δ The Raoult absorption coefficient. The number of g of the gas dissolved by 100 cm ³ of the solvent at the temperature of experiment when the	δ Coefficient d'absorption de Raoult. C' est le nombre de grammes du gaz dissout dans 100 cm ³ du solvant à la température de l'expérience	δ Der Raoult-Absorptionskoeffizient. Ist die Anzahl der Gramme des Gases welche von 100 cm ³ des Lösungsmittels bei der Versuchs-	δ Coefficiente di assorbimento di Raoult. Numero di grammi di gas disciolti da 100 cm ³ di solvente alla temperatura dell'esperienza, quando	

partial pressure of the gas is 760 mm.		lorsque la pression partielle du gaz est de 760 mm.		temperatur gelöst werden und wenn der Partialdruck des Gases 760 mm be- trägt.		la pressione par- ziale del gas è di 760 mm.	
λ	The Ostwald absorp- tion coefficient. The ratio of the concen- tration of the gas in the liquid to its con- centration in the gas phase.	λ	Coefficient d'absorp- tion d'Ostwald. C' est le rapport de la concentration du gaz dans le liquide à sa concentration dans la phase gazeuse.	λ	Der Ostwald-Absorp- tionskoeffizient. Die- ser ist das Verhält- nis der Konzentra- tion des Gases in der Lösung zu der in der Gasphase.	λ	Coefficiente di assorbi- mento di Ostwald. Rapporto tra la concentrazione del gas nel liquido e nella fase gassosa.
B	Barometric pressure.	B	Pression barométrique.	B	Barometerdruck.	B	Pressione barometrica.
K	Henry's law constant. $K = \frac{p_A}{x_A}$	K	Constante de la loi de Henry. $K = \frac{p_A}{x_A}$	K	Konstante des Henry'- schen Gesetzes. $K = \frac{p_A}{x_A}$	K	Costante della legge di Henry. $K = \frac{p_A}{x_A}$
p_A (resp. P)	Partial pressure of A (resp. total pres- sure).	p_A (resp. P)	Pression partielle de A (resp. pres- sion totale).	p_A (bezw. P)	Partialdruck von A (bzw. Totaldruck).	p_A (oppure P)	Pressione par- ziale di A (oppure pressione totale).
S. T. P.	Under standard condi- tions, 0°C, 1 atm.	S. T. P.	Dans les conditions standard, 0°C, 1 atm.	S. T. P.	Unter Normal (Stan- dard) - Bedingungen, 0°C, 1 Atmosphäre.	S. T. P.	Condizioni normali, 0°C, 1 atm.
t (resp. T)	Centigrade (resp. absolute) tempera- ture.	t (resp. T)	Température centi- grade (resp. absolue).	t (bezw. T)	Zentigrad (bzw. ab- solute)-Temperatur.	t (oppure T)	Temperatura centigrada (o asso- luta).
x_A	Mole fraction of A in the solution.	x_A	Fraction moléculaire de A dans la solu- tion.	x_A	Molenbruch von A in der Lösung.	x_A	Frazione di grammi- molecole di A nella soluzione.

MATHEMATICAL RELATIONS AND CONVENTIONS

In all cases where interconversion of g of gas and cm³ at S. T. P. has been made, the normal molecular volume has been taken as 22 411.5 cm³ and the coefficient of thermal expansion as 1/273.1 per degree.

$$\alpha = \frac{\text{g/cm}^3, \text{liq.}}{\text{g/cm}^3, \text{gas}} \div \left(1 + \frac{t}{273.1}\right) = \frac{273.1\lambda}{T}$$

$$\gamma = \frac{\lambda}{\left(1 + \frac{t}{273.1}\right)} d, \text{ where } d \text{ is the density of the solvent.}$$

$$\lambda = \frac{C_A}{C_A'} = \frac{\text{concentration, liq.}}{\text{concentration, gas}}$$

According to the Henry-Dalton laws, λ is independent of the partial pressure of the gas.

$$\log_{10} K = \frac{0.05223(-A)}{T} + B.$$

The quantities A and B are given in the tables. The quantity (A) is the partial latent heat of vaporization of the gas from the solution, in joules per g mole, *i.e.*, the heat absorbed when one g-mole of the gas is vaporized reversibly from an infinite amount of the solution.

To compute K from α :

$$K = \frac{17\,032\,400d(1+a)}{M\alpha},$$

where d is the density and M the molecular weight of the solvent; a is small in comparison with unity and is given by

$$a = \frac{Mp_A\alpha}{17\,032\,400d}$$

where p_A is the partial pressure of the dissolving gas in mm Hg.

SOLUBILITIES OF GASES IN WATER

A. G. LOOMIS

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A-TABLE.—ELEMENTARY GASES AND ATMOSPHERIC AIR
A, Argon; *cf. also* (46, 111)

$t, ^\circ\text{C} \dots\dots\dots$	0	10	20	30	40	Lit.
$10^{-7} \times K \dots\dots\dots$	1.79	2.25	2.70	3.14	3.47	(101, 105)
$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	
0	1.635	20	2.511	40	3.265	
5	1.861	25	2.708	45	3.447	
10	2.089	30	2.895	50	3.632	
15	2.304	35	3.084	Lit.	(21)	

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An, Actinon (Ac. Em.); *v.* (36)

Br, Bromine (Br₂); *cf. also* (17, 18, 46)

$$\log_{10} K = \frac{0.05223}{T} \times (-33780) + 10.674; \text{ range, 0 to } 10^\circ\text{C}$$

$t, ^\circ\text{C}$	$10^{-4} \times K$	$t, ^\circ\text{C}$	$10^{-4} \times K$
12	3.07	20	4.51
14	3.39	22	4.94
16	3.74	24	5.39
18	4.12	26	5.85

Br.—(Continued)

$t, ^\circ\text{C}$	$10^{-4} \times K$	$t, ^\circ\text{C}$	$10^{-4} \times K$
28	6.37	60	19.1
30	6.88	70	24.4
40	10.1	80	30.7
50	14.5	Lit.	(102, 103)

Cl, Chlorine (Cl_2); cf. also (2, 46, 66)

$t, ^\circ\text{C}$	β	$t, ^\circ\text{C}$	β	$t, ^\circ\text{C}$	β	$t, ^\circ\text{C}$	β
10	3.148	18	2.440	26	1.970	50	1.216
11	3.047	19	2.368	27	1.923	60	1.025
12	2.950	20	2.299	28	1.880	70	0.862
13	2.856	21	2.238	29	1.839	80	0.683
14	2.767	22	2.180	30	1.799	90	0.39
15	2.680	23	2.123	35	1.608	100	0.00
16	2.597	24	2.070	40	1.450	Lit.	(106)
17	2.517	25	2.019	45	1.320		

$t, ^\circ\text{C}$	0	3	6	9	12	Lit.
β	4.61	3.93	3.42	3.03	2.77	(3)

H, Hydrogen (H_2); cf. also (46)

p_{H_2} , mm.....	560	600	650	700	727	Lit.
$10^6\alpha$, 25°C.....	1814	1807	1798	1790	1786	(20)
t , °C.....	20		25		Lit.	
K	5.07×10^7		5.18×10^7		(39)	

$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$
0	4.391	14	4.928
1	4.430	15	4.964
2	4.470	16	4.998
3	4.509	17	5.034
4	4.548	18	5.070
5	4.587	19	5.107
6	4.625	20	5.138
7	4.664	21	5.170
8	4.703	22	5.203
9	4.742	23	5.234
10	4.778	24	5.265
11	4.818	25	5.296
12	4.854	26	5.325
13	4.891	Lit.	(91)

$t, ^\circ\text{C}$ (97, 99, 100)	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$
0	4.401	20	5.192
1	4.447	21	5.228
2	4.491	22	5.264
3	4.537	23	5.302
4	4.580	24	5.340
5	4.623	25	5.374
6	4.669	26	5.408
7	4.710	27	5.443
8	4.753	28	5.477
9	4.797	29	5.510
10	4.834	30	5.540
11	4.871	35	5.638
12	4.909	40	5.709
13	4.947	45	5.765
14	4.982	50	5.809
15	5.017	60	5.810
16	5.052	70	5.78
17	5.087	80	5.74
18	5.120	90	5.71
19	5.155	100	5.66

 $t = 19.5^\circ\text{C}$ (15) || $t = 23^\circ\text{C}$ (15)

$p_{\text{H}_2}, \text{mm}$	$10^3 \alpha$	$p_{\text{H}_2}, \text{mm}$	$10^3 \alpha$	$p_{\text{H}_2}, \text{mm}$	$10^3 \alpha$	$p_{\text{H}_2}, \text{mm}$	$10^3 \alpha$
900	16.76	5000	16.41	1100	16.01	5000	15.76
1000	16.76	5500	16.28	1500	16.00	5500	15.65
1500	16.75	6000	16.14	2000	16.00	6000	15.52
2000	16.75	6500	15.97	2500	15.99	6500	15.38
2500	16.73	7000	15.80	3000	15.98	7000	15.23
3000	16.71	7500	15.59	3500	15.96	7500	15.06
3500	16.67	8000	15.36	4000	15.92	8000	14.86
4000	16.61	8250	15.23	4500	15.85	8200	14.78
4500	16.52						

He, Helium; cf. also (46, 111)

$$\log_{10} K = \frac{0.05223}{T} \times (-3053) + 8.584; \text{ range, 2 to } 30^\circ\text{C} \text{ (13)}$$

$t, ^\circ\text{C}$ (1)	0	10	20	30	40	50
$10^{-7} \times K$	9.78	9.54	9.50	9.39	9.19	8.73

Kr, Krypton; cf. also (46, 111)

$t, ^\circ\text{C}$	0	10	20	30	40	50	60	Lit.
$10^{-7} \times K$	0.945	1.170	1.510	1.850	2.182	2.471	2.649	(1)

N, Nitrogen (N_2); cf. also (16, 46)

$t, ^\circ\text{C}$	20	25	Lit.		
K	5.939×10^7	6.297×10^7	(39)		
$p_{\text{N}_2}, \text{mm}$	$10^3\alpha, 25^\circ\text{C}$	$p_{\text{N}_2}, \text{mm}$	$10^3\alpha, 25^\circ\text{C}$	$p_{\text{N}_2}, \text{mm}$	$10^3\alpha, 25^\circ\text{C}$
270	14.38	500	14.26	800	14.36
300	14.37	601.6	14.20	830	14.38
400	14.31	700	14.28	Lit.	(20)

Atmospheric N_2 = 98.815 vol. % N_2 + 1.185 vol. % A (30)

$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$
0	4.007	9	4.893	18	5.731	27	6.493
1	4.103	10	4.988	19	5.816	28	6.573
2	4.200	11	5.084	20	5.906	29	6.655
3	4.299	12	5.178	21	5.991	30	6.730
4	4.395	13	5.273	22	6.076	35	7.120
5	4.496	14	5.365	23	6.160	40	7.493
6	4.593	15	5.457	24	6.244	45	7.874
7	4.694	16	5.548	25	6.331	50	8.244
8	4.794	17	5.638	26	6.411		

Argon-free N_2 , computed from the above values

$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$
0	4.077	15	5.550	30	6.846	45	7.988
5	4.572	20	6.004	35	7.235	50	8.371
10	5.074	25	6.435	40	7.608		

Atmospheric N_2 (98, 99, 100)

$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$
0	4.016	10	5.079	20	6.109	30	7.022
1	4.116	11	5.184	21	6.203	35	7.483
2	4.219	12	5.291	22	6.298	40	7.923
3	4.323	13	5.399	23	6.394	45	8.285
4	4.428	14	5.497	24	6.485	50	8.586
5	4.535	15	5.606	25	6.574	60	9.087
6	4.641	16	5.710	26	6.670	70	9.462
7	4.753	17	5.811	27	6.759	80	9.591
8	4.861	18	5.912	28	6.845	90	9.61
9	4.970	19	6.013	29	6.932	100	9.54

Argon-free N_2 , computed from the above values

$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$
0	4.089	15	5.704	30	7.149	45	8.427
5	4.609	20	6.217	35	7.614	50	8.722
10	5.168	25	6.686	40	8.051		

$t = 19.4^{\circ}\text{C} \text{ (15)}$				$t = 24.9^{\circ}\text{C} \text{ (15)}$			
$p_{\text{N}_2}, \text{mm}$	$10^3\alpha$	$p_{\text{N}_2}, \text{mm}$	$10^3\alpha$	$p_{\text{N}_2}, \text{mm}$	$10^3\alpha$	$p_{\text{N}_2}, \text{mm}$	$10^3\alpha$
900	15.10	5000	14.45	900	13.70	5000	13.08
1000	15.08	5500	14.35	1000	13.69	5500	12.99
1500	15.01	6000	14.24	1500	13.63	6000	12.90
2000	14.93	6500	14.13	2000	13.58	6500	12.81
2500	14.86	7000	14.02	2500	13.50	7000	12.73
3000	14.79	7500	13.90	3000	13.42	7500	12.64
3500	14.71	8000	13.77	3500	13.33	8000	12.55
4000	14.63	8100	13.75	4000	13.25	8200	12.52
4500	14.54			4500	13.16		

Ne, Neon; *cf. also* (46, 92, 111)

$t, ^{\circ}\text{C}$	0	10	20	30	40	50	Lit.
$10^{-7} \times K$	8.67	7.69	6.76	5.71	4.37	2.94	(1)

O, Oxygen (O_2); *cf. also* (46)Results obtained by measuring volume of O_2 absorbed by H_2O (98, 105)

$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$
20	3.043	25	3.330	30	3.610	60	4.777
21	3.100	26	3.386	35	3.852	70	5.043
22	3.157	27	3.444	40	4.068	80	5.224
23	3.215	28	3.500	45	4.281	90	5.31
24	3.273	29	3.555	50	4.470	100	5.33

Results obtained by titrating O_2 in air-saturated water (96, 99, 100)

$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$
0	1.9336	8	2.3734	16	2.8211	24	3.259
1	1.9870	9	2.4294	17	2.8764	25	3.314
2	2.0407	10	2.4860	18	2.9322	26	3.368
3	2.0955	11	2.5420	19	2.9863	27	3.425
4	2.1502	12	2.5983	20	3.0415	28	3.481
5	2.2053	13	2.6550	21	3.095	29	3.540
6	2.2618	14	2.7103	22	3.150	30	3.599
7	2.3171	15	2.7661	23	3.205		

$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$	$t, ^{\circ}\text{C}$	$10^{-7} \times K$
0	1.9206	9	2.4056	18	2.8928	27	3.369
1	1.9745	10	2.4602	19	2.9472	28	3.420
2	2.0284	11	2.5142	20	3.001	29	3.471
3	2.0825	12	2.5687	21	3.054	30	3.522
4	2.1362	13	2.6226	22	3.107	35	3.771
5	2.1901	14	2.6764	23	3.160	40	4.009
6	2.2436	15	2.7310	24	3.213	45	4.234
7	2.2975	16	2.7852	25	3.265	50	4.445
8	2.3516	17	2.8392	26	3.317	Lit.	(30)

$t = 23^{\circ}\text{C} \text{ (15)}$				$t = 25.9^{\circ}\text{C} \text{ (15)}$			
$p_{\text{O}_2}, \text{mm}$	$10^3\alpha$	$p_{\text{O}_2}, \text{mm}$	$10^3\alpha$	$p_{\text{O}_2}, \text{mm}$	$10^3\alpha$	$p_{\text{O}_2}, \text{mm}$	$10^3\alpha$
900	27.11	5000	26.24	800	26.00	5000	25.27
1000	27.10	5500	26.05	1000	26.00	5500	25.13
1500	27.09	6000	25.86	1500	25.98	6000	24.97
2000	27.06	6500	25.66	2000	25.93	6500	24.81
2500	27.00	7000	25.46	2500	25.85	7000	24.63
3000	26.89	7500	25.25	3000	25.76	7500	24.45
3500	26.74	8000	25.04	3500	25.65	8000	24.24
4000	26.57	8150	24.98	4000	25.53	8200	24.15
4500	26.41			4500	25.40		

For a graphical representation of the amount of O_2 , saturated with water vapor, dissolved in H_2O from air, between 32 to 210°F and 0 to 30 in. Hg, *v.* (84).

 O_3 , Ozone; *cf. also* (46)At 0°C , $K = 1.915 \times 10^6$ (75); at 18°C , $K = 2.080 \times 10^6$ (27)

$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$
0	1.475	20	2.856	40	9.110	60	∞
5	1.660	25	3.475	45	13.58	Lit.	(55)
10	1.884	30	4.548	50	20.85		
15	2.191	35	6.220	55	36.14		

Rn, Radon; *cf. also* (46, 111)

The following data are from Meyer (60), and are based upon (10, 44, 51, 52, 71, 90). They are in agreement also with (80).

$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$
0	1.855	20	3.97	50	7.92	80	10.6
5	2.295	30	5.26	60	8.94	90	11.1
10	2.805	40	6.63	70	9.84	100	11.6

The following data are by Szeparowicz (88.5):

$$\log_{10} K = \frac{0.05223}{T} \times (-25598) + 11.157; \text{ range, } 0 \text{ to } 16^{\circ}\text{C}$$

$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$	$t, ^{\circ}\text{C}$	$10^{-6} \times K$
17	3.53	23	4.33	29	5.13	60	9.05
18	3.66	24	4.46	30	5.27	70	10.26
19	3.79	25	4.59	35	5.92	80	10.9
20	3.93	26	4.73	40	6.57	90	11.2
21	4.06	27	4.87	45	7.20	97	11.3
22	4.19	28	5.00	50	7.83		

Tn, Thoron (Th. Em.); *v.* (10, 36, 42)Xe, Xenon; *cf. also* (46, 111)

$$\log_{10} K = \frac{0.05223}{T} \times (-21384) + 10.681; \text{ range, } 0 \text{ to } 20^{\circ}\text{C}$$

$t, ^{\circ}\text{C}$	30	40	45.45	Lit.
$10^{-6} \times K$	9.629	11.76	12.95	(1)

Air (104); *cf. also* (46)

$t, ^{\circ}\text{C}$	$10^{-7} \times K_1^*$	$10^{-7} \times K_2^\dagger$	$t, ^{\circ}\text{C}$	$10^{-7} \times K_1^*$	$10^{-7} \times K_2^\dagger$
0	3.277	3.220	20	5.044	4.938
1	3.361	3.303	21	5.130	5.019
2	3.450	3.392	22	5.216	5.102
3	3.536	3.477	23	5.297	5.182
4	3.624	3.564	24	5.379	5.265
5	3.712	3.653	25	5.468	5.351
6	3.803	3.738	26	5.544	5.428
7	3.894	3.826	27	5.625	5.512
8	3.985	3.913	28	5.702	5.597
9	4.076	4.002	29	5.781	5.683
10	4.168	4.088	30	5.858	5.765
11	4.257	4.176	35	6.249	
12	4.347	4.262	40	6.611	
13	4.438	4.348	45	6.916	
14	4.525	4.436	50	7.188	
15	4.612	4.520	60	7.645	
16	4.701	4.605	70	7.981	
17	4.789	4.689	80	8.166	
18	4.874	4.773	90	8.22	
19	4.964	4.856	100	8.16	

* K_1 is calculated from the absorption coefficients of O_2 and N_2 , taking into consideration the correction for constant argon content. See Fox (30).

† K_2 is calculated from the O_2 -content of water saturated with air, and from O_2 -content of the air expelled by heating the solution.

The following table gives content of 1000 cm³ of water, saturated with air at normal barometric pressure. The air is free of CO₂ and NH₃ (107).

<i>t</i> , °C	cm ³ at 0°C and 760 mm		Total	O ₂ -content of the dissolved air, Vol. %
	O ₂	N ₂ , A, etc.		
0	10.19	18.99	29.18	34.91
1	9.91	18.51	28.42	34.87
2	9.64	18.05	27.69	34.82
3	9.39	17.60	26.99	34.78
4	9.14	17.18	26.32	34.74
5	8.91	16.77	25.68	34.69
6	8.68	16.38	25.06	34.65
7	8.47	16.00	24.47	34.60
8	8.26	15.64	23.90	34.56
9	8.06	15.30	23.36	34.52
10	7.87	14.97	22.84	34.47
11	7.69	14.65	22.34	34.43
12	7.52	14.35	21.87	34.38
13	7.35	14.06	21.41	34.34
14	7.19	13.78	20.97	34.30
15	7.04	13.51	20.55	34.25
16	6.89	13.25	20.14	34.21
17	6.75	13.00	19.75	34.17
18	6.61	12.77	19.38	34.12
19	6.48	12.54	19.02	34.08
20	6.36	12.32	18.68	34.03
21	6.23	12.11	18.34	33.99
22	6.11	11.90	18.01	33.95
23	6.00	11.69	17.69	33.90
24	5.89	11.49	17.38	33.86
25	5.78	11.30	17.08	33.82
26	5.67	11.12	16.79	33.77
27	5.56	10.94	16.50	33.73
28	5.46	10.75	16.21	33.68
29	5.36	10.56	15.92	33.64
30	5.26	10.38	15.64	33.60

B-TABLE.—STANDARD ARRANGEMENT

HF, Hydrogen fluoride (59)

HCl, Hydrogen chloride; *cf. also* (46, 110)

<i>t</i> , °C	β	<i>t</i> , °C	β	<i>t</i> , °C	β	<i>t</i> , °C	β
0	507	10	474	20	442	30	412
2	500	12	468	22	435	40	386
4	494	14	461	24	429	50	362
6	487	16	455	26	423	60	339
8	481	18	448	28	417	Lit. (74)	

<i>t</i> , °C	$\frac{g \text{ HCl}^*}{g \text{ H}_2\text{O}}$	<i>t</i> , °C	β	$\frac{g \text{ HCl}^*}{g \text{ H}_2\text{O}}$
-24	101.2	-10	550.4	89.8
-21	98.3	-5	532.7	86.8
-18	95.7	0	517.0	84.2
-15	93.3	Lit. (4)		

* *P* = 1 atm. (total *P* of HCl).

<i>p</i> _{HCl} , mm at 25°C (6)	$\frac{g \text{ HCl}}{g \text{ H}_2\text{O}}$	cm ³ HCl (S. T. P.) per cm ³ H ₂ O
0.0182	0.1458	89.38
0.0530	0.1823	111.73
0.140	0.2188	134.08
0.348	0.2552	156.42
0.844	0.2917	178.77
1.93	0.3282	201.11
4.20	0.3646	223.46

HBr, Hydrogen bromide (5); *cf. also* (46, 69)

<i>t</i> , °C	β	$\frac{g \text{ HBr}^*}{g \text{ H}_2\text{O}}$	<i>t</i> , °C	β	$\frac{g \text{ HBr}^*}{g \text{ H}_2\text{O}}$
-25		255.0	0	612	221.2
-20		247.3	+ 10	580	209.6
-15		240.0	25	533	193.9
-10	645	233.5	50	469	171.3
-5	629	227.5	75	406	150.5
			100	345	130.0

* *P* = 1 atm.

<i>p</i> _{HBr} , mm at 25°C (6)	$\frac{g \text{ HBr}}{g \text{ H}_2\text{O}}$	cm ³ HBr (S. T. P.) per cm ³ H ₂ O
0.000151	0.4855	134.08
0.00370	0.5665	156.42
0.0089	0.6474	178.77
0.0226	0.7283	201.11
0.059	0.8092	223.46
0.151	0.8902	245.80

HI, Hydrogen iodide; *cf. also* (46)

<i>p</i> _{HI} , mm at 25°C (6)	$\frac{g \text{ HI}}{g \text{ H}_2\text{O}}$	cm ³ HI (S. T. P.) per cm ³ H ₂ O
0.00057	0.7676	134.08
0.00182	0.8956	156.42
0.0065	1.0235	178.77
0.0295	1.1515	201.11
0.132	1.2794	223.46

At 10°C, β = 416 (8).

SO₂, Sulfur dioxide; *cf. also* (46, 54)

$$\log_{10} K = \frac{0.05223}{T} \times (-24619) + 8.805; \text{ range, 10 to } 30^\circ\text{C} \text{ (38)}$$

<i>t</i> , °C	10 ⁻⁴ × <i>K</i>	<i>t</i> , °C	10 ⁻⁴ × <i>K</i>	<i>t</i> , °C	10 ⁻⁴ × <i>K</i>	<i>t</i> , °C	10 ⁻⁴ × <i>K</i>
30	3.640	50	6.53	70	10.43	90	15.05
35	4.259	55	7.43	75	11.60	Lit. (38)	
40	4.954	60	8.39	80	12.76		
45	5.716	65	9.38	85	13.90		

<i>t</i> , °C	β	<i>t</i> , °C	β	<i>t</i> , °C	β	<i>t</i> , °C	β
0	79.79	17	43.91	22	36.59	35	22.49
4	69.78	18	42.35	23	35.30	40	18.78
10	56.65	19	40.78	24	33.94	Lit. (31)	
15	47.28	20	39.37	25	32.76		
16	45.57	21	37.98	30	27.18		

<i>t</i> = 0°C (50)		<i>t</i> = 25°C (50)		<i>t</i> = 50°C (50)	
<i>p</i> _{SO₂} , mm	mg SO ₂ per cm ³ solution	<i>p</i> _{SO₂} , mm	mg SO ₂ per cm ³ solution	<i>p</i> _{SO₂} , mm	mg SO ₂ per cm ³ solution
0.4	0.537	1.4	0.534	4.9	0.525
1.0	1.000	5.0	1.16	10.0	0.920
5.0	3.092	10.0	2.03	50.0	3.46
25.0	10.78	50.0	8.28	100.0	6.23
50.0	19.35	100.0	14.98	200.0	11.59
75.0	27.55	150.0	21.03	300.0	16.77
100.0	35.27	200.0	26.48	400.0	21.72
110.0	38.24	250.0	31.52	500.0	26.64
		300.0	36.27	600.0	31.56
		313.0	37.50	700.0	36.47

<i>t</i> , °C	40	50	60	70	80	90	95	Lit.
mg*	53	38.3	26.3	16.6	9.8	5.8	4.2	(65)

* mg SO₂ per cm³ solution at *p*_{SO₂} = 760 mm.

$t, ^\circ\text{C}$	$p_{\text{SO}_2}, \text{mm}$	mg^*	$t, ^\circ\text{C}$	$p_{\text{SO}_2}, \text{mm}$	mg^*
10	155	33.5	50	457	20.8
	455	89.1	60	157	0.3
30	157	13.7		457	13.4
	457	45.7	80	457	3.3
50	156	4.1		655	8.9

* mg SO_2 per cm^3 solution at $p_{\text{SO}_2} = 760 \text{ mm}$.

H_2S , Hydrogen sulfide; *cf. also* (46, 79). At 25°C , $K = 4.168 \times 10^5$ (40)

$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$
0	20.318	14	31.276	28	44.30
1	20.982	15	32.14	29	45.32
2	21.665	16	33.01	30	46.29
3	22.409	17	33.94	35	51.40
4	23.138	18	34.84	40	56.59
5	23.896	19	35.74	45	61.83
6	24.640	20	36.66	50	67.19
7	25.408	21	37.56	60	78.19
8	26.202	22	38.53	70	90.53
9	27.023	23	39.50	80	102.6
10	27.825	24	40.47	90	109
11	28.715	25	41.38	100	112
12	29.549	26	42.36		
13	30.432	27	43.35		

Lit. (106)

H_2Se , Hydrogen selenide; *cf. also* (46)

$\log_{10} K = \frac{0.05223}{T} \times (-10072) + 7.466$; range, 14.6 to 35°C (53)

NO , Nitric oxide (100, 104); *cf. also* (46)

$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$
0	12.808	10	16.540	20	20.055	30	23.511
1	13.160	11	16.918	21	20.402	35	25.170
2	13.520	12	17.284	22	20.756	40	26.750
3	13.886	13	17.639	23	21.112	45	28.277
4	14.247	14	17.996	24	21.455	50	29.638
5	14.634	15	18.353	25	21.806	60	31.779
6	15.012	16	18.707	26	22.155	70	33.215
7	15.398	17	19.030	27	22.497	80	34.031
8	15.770	18	19.396	28	22.841	90	34.33
9	16.170	19	19.728	29	23.176	100	34.45

N_2O , Nitrous oxide; *cf. also* (43, 46)

$\log_{10} K = \frac{0.05223}{T} \times (-23298) + 10.3313$; range, 5 to 16°C (32)

$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$
20	1.5000	25	1.7323		

$t, ^\circ\text{C}$	$10^{-6} \times K^*$	$t, ^\circ\text{C}$	$10^{-6} \times K^*$	$t, ^\circ\text{C}$	$10^{-6} \times K^*$
18	1.431	26	1.756	34	2.213
20	1.501	28	1.855	36	2.361
22	1.581	30	1.966		
24	1.664	32	2.091		

Lit. (45)

* In the original the volume of dissolved gas (in cm^3 at t° under atmospheric pressure) per 1 cm^3 of solvent is given. Since the gas was saturated with the solvent the volume of dissolved gas is independent of the pressure (assuming Henry's Law). See Manchot (57).

$p_{\text{NH}_3}, \text{mm}$	$758-1362$	$273-1028$	Lit.
$K, 25^\circ\text{C}$	1.739×10^6	1.760×10^6	(22, 23)

N_2O_3 , Nitrogen trioxide (78)

NH_3 , Ammonia; *cf. also* (7, 14, 41, 46, 76, 82)

$$\log_{10} K = \frac{0.05223A}{T} + B$$

From 0 to 10°C , $A = -9376$, $B = 4.987$.

From 14 to 28°C , $A = -10746$, $B = 5.238$.

At $t = 12^\circ\text{C}$, $K = 1863$ (72).

Up to $C = 1.6$ moles NH_3 per liter of solution, $p_{\text{NH}_3} (\text{mm}) = 12.9C (1 + 0.046C)$ at 25°C (94).

$t = 0^\circ\text{C}$ (64)

$p_{\text{NH}_3}, \text{mm}$	Ratio $\text{NH}_3/\text{H}_2\text{O}$		d_4^0	$p_{\text{NH}_3}, \text{mm}$	Ratio $\text{NH}_3/\text{H}_2\text{O}$		d_4^0
	g/g	cm^3/cm^3			g/g	cm^3/cm^3	
900	0.997	1312	0.844	1500	1.588	2090	0.812
1000	1.094	1440	0.839	1600	1.688	2221	0.807
1100	1.192	1569	0.833	1700	1.778	2340	0.802
1200	1.288	1695	0.828	1800	1.847	2431	0.798
1300	1.388	1827	0.822	1865	1.887	2483	0.795
1400	1.488	1958	0.817				

$t = 20^\circ\text{C}$ (64)

700	0.497	652.9	0.883	2100	0.984	1292.6	0.833
800	0.544	714.6	0.878	2200	1.007	1322.8	0.831
900	0.588	772.4	0.873	2300	1.029	1351.7	0.829
1000	0.629	826.2	0.868	2400	1.052	1381.8	0.828
1100	0.669	878.8	0.863	2500	1.074	1410.8	0.826
1200	0.707	928.8	0.858	2600	1.096	1439.6	0.824
1300	0.745	978.7	0.854	2700	1.117	1467.3	0.823
1400	0.781	1025.9	0.851	2800	1.140	1497.4	0.822
1500	0.815	1070.6	0.848	2900	1.162	1526.4	0.820
1600	0.847	1112.6	0.845	3000	1.185	1556.6	0.819
1700	0.877	1152.1	0.842	3100	1.207	1585.5	0.817
1800	0.906	1190.1	0.840	3200	1.230	1615.7	0.816
1900	0.934	1226.9	0.838	3277	1.249	1640.7	0.815
2000	0.959	1259.7	0.836				

$t = 40^\circ\text{C}$ (64)

750	0.315	411.3	0.9019	2200	0.611	797.8	0.8556
800	0.329	429.6	0.8994	2400	0.644	840.9	0.8518
1000	0.386	504.0	0.8896	2600	0.676	882.7	0.8480
1200	0.433	565.4	0.8811	2800	0.706	921.7	0.8444
1400	0.472	616.3	0.8740	3000	0.732	955.8	0.8407
1600	0.508	663.3	0.8685	3200	0.758	989.8	0.8367
1800	0.543	709.0	0.8638	3400	0.784	1023.7	0.8327
2000	0.577	753.4	0.8596	3640	0.816	1065.5	0.8280

$P, ^\circ\text{mm}$	Ratio $\text{NH}_3/\text{H}_2\text{O}$		$P, ^\circ\text{mm}$	Ratio $\text{NH}_3/\text{H}_2\text{O}$	
	g/g	cm^3/cm^3		g/g	cm^3/cm^3

$t = 10^\circ\text{C}$ (29)

$t = 20^\circ\text{C}$ (29)

300	0.414	544.6	300	0.2945	386.9
500	0.541	711.7	500	0.4124	541.7
700	0.6584	866.2	700	0.5083	667.7
900	0.7637	1004.7	900	0.5911	776.5
1100	0.8709	1145.7	1100	0.6694	879.3
1300	0.9782	1286.9	1300	0.7422	974.9
1500	1.0855	1428.0	1500	0.8149	1070.4

$P, ^\circ\text{mm}$	Ratio $\text{NH}_3/\text{H}_2\text{O}$	
	g/g	cm^3/cm^3

$t = 30^\circ\text{C}$ (29)

300	0.2121	277.9
500	0.3080	403.5
700	0.3879	508.2
900	0.4556	596.9
1100	0.5186	679.5
1300	0.5773	756.4
1500	0.6313	827.1

* Total pressure, $\text{NH}_3 + \text{H}_2\text{O} = \text{approx. } p_{\text{NH}_3}$.

PH_3 , Phosphine; *cf. also* (46). At 17°C , $K = 3.63 \times 10^6$ (86)

AsH_3 , Arsine (83)

SbH_3 , Stibine (87)

CO , Carbon monoxide; *cf. also* (46)

$t, ^\circ\text{C}$	20	25	Lit.
K	3.916×10^7	4.281×10^7	(39)

CO.—(Continued)

$t, ^\circ\text{C}$ (100, 104)	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$	$t, ^\circ\text{C}$	$10^{-7} \times K$
0	2.673	10	3.357	20	4.070	30	4.711
1	2.736	11	3.428	21	4.137	35	5.007
2	2.801	12	3.499	22	4.185	40	5.285
3	2.868	13	3.571	23	4.272	45	5.540
4	2.934	14	3.643	24	4.337	50	5.784
5	3.002	15	3.715	25	4.401	60	6.247
6	3.072	16	3.787	26	4.467	70	6.420
7	3.142	17	3.858	27	4.530	80	6.425
8	3.213	18	3.931	28	4.592	90	6.43
9	3.284	19	3.997	29	4.652	100	6.43

p_{CO}, mm	$10^3 \alpha$ (15)		p_{CO}, mm	$10^3 \alpha$ (15)	
	17.7°C	19°C		17.7°C	19°C
900	26.18	25.41	4500	25.97	25.09
1000	26.17	25.40	5000	25.93	25.04
1500	26.15	25.37	5500	25.88	24.98
2000	26.13	25.33	6000	25.83	24.91
2500	26.11	25.28	6500	25.77	24.82
3000	26.08	25.23	7000	25.70	24.71
3500	26.05	25.19	7500	25.61	24.58
4000	26.01	25.14	8000	25.50	24.45

CO₂, Carbon dioxide; cf. also (11, 46, 68). At 25°C, $K = 1.247 \times 10^6$ (39)

$p_{\text{CO}_2}, \text{mm}$	743-1351	270-988
$K, 25^\circ\text{C}$	1.254×10^6	1.256×10^6
Lit.....	(22, 25)	(24, 26)

$t(^{\circ})$	$10^{-6} \times K$	t	$10^{-6} \times K$	t	$10^{-6} \times K$	t	$10^{-6} \times K$
0	0.5526	9	0.7642	18	1.018	27	1.309
1	0.5751	10	0.7915	19	1.049	28	1.342
2	0.5976	11	0.8197	20	1.079	29	1.379
3	0.6199	12	0.8455	21	1.111	30	1.414
4	0.6426	13	0.8732	22	1.144	35	1.588
5	0.6663	14	0.9018	23	1.177	40	1.771
6	0.6893	15	0.9297	24	1.209	45	1.954
7	0.7132	16	0.9581	25	1.243	50	2.153
8	0.7381	17	0.9877	26	1.278	60	2.590

$t, ^\circ\text{C}$ (45).....	20	22	24	26
$10^{-6} \times K^*$	1.127	1.174	1.229	1.290
$t, ^\circ\text{C}$ (45).....	28	30	32	34
$10^{-6} \times K^*$	1.358	1.434	1.518	1.613

* In the original the volume of dissolved gas (in cm³ at $t, ^\circ\text{C}$ under atmospheric pressure) per 1 cm³ of solvent is given. Since the gas was saturated with the solvent the volume of dissolved gas is independent of the pressure (assuming Henry's Law). See Manchot (57).

P = total pressure in atm. cm³ = cm³ of CO₂ (reduced to 0°C and 1 atm.) dissolved by 1 cm³ of the solution at P and t (77).

$t = 20^\circ\text{C}$		$t = 35^\circ\text{C}$ —(Continued)	
P	cm ³	P	cm ³
25	16.33	40	13.38
30	18.21	45	15.11
35	20.11	50	16.83
40	22.02	55	18.59
45	23.93	60	20.39
50	25.79	65	22.28
53	26.87	68	23.43
$t = 35^\circ\text{C}$		70	26.9
30	9.98	75	28.8
35	11.68	77	29.6

 $t = 60^\circ\text{C}$

P	cm ³		P	cm ³	
40	8.5	8.5	70	7.22	5.31
45	9.2	9.4	75	7.63	6.05
50	10.0	10.4	80	8.05	6.76
55	10.9	11.4	85	8.56	7.43
60	11.8	12.4	90	9.07	8.05
65	12.8	13.5	95	9.57	8.68
70	13.8	14.5	100	10.06	9.30
75	14.9	15.5	105	10.57	9.93
80	16.0	16.6	110	11.09	10.51
85	17.2	17.8	115	11.59	11.05
90	18.5	19.1	120	12.09	11.54
95	19.7	20.4	125	12.60	11.94
100	21.0	21.8	130	13.10	12.28
105	22.5	23.3	135	13.61	12.53
110	23.9	24.7	140	14.10	12.72
115	25.3	26.3	145	14.61	12.87
116	25.6	26.6	150	15.12	
$t = 100^\circ\text{C}$			155	15.55	
58	6.35		160	15.91	
60	6.49		165	16.15	
65	6.84				

CH₄, Methane (104); cf. also (28, 46, 56)

$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$
0	16.994	10	22.575	20	28.531	30	34.08
1	17.504	11	23.210	21	29.069	35	36.95
2	18.029	12	23.814	22	29.665	40	39.46
3	18.564	13	24.403	23	30.239	45	41.83
4	19.116	14	25.001	24	30.804	50	43.85
5	19.689	15	25.600	25	31.36	60	47.57
6	20.249	16	26.192	26	31.93	70	50.62
7	20.828	17	26.769	27	32.48	80	51.84
8	21.422	18	27.383	28	33.03	90	52.60
9	22.024	19	27.961	29	33.56	100	53.3

C₂H₂, Acetylene (108); cf. also (46)

$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$
0	0.547	8	0.690	16	0.841	24	0.993
1	0.564	9	0.708	17	0.858	25	1.01
2	0.581	10	0.727	18	0.878	26	1.03
3	0.599	11	0.746	19	0.897	27	1.05
4	0.619	12	0.765	20	0.917	28	1.07
5	0.635	13	0.783	21	0.935	29	1.09
6	0.653	14	0.803	22	0.955	30	1.11
7	0.671	15	0.822	23	0.974		

C₂H₄, Ethylene (108); cf. also (46)

$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$
0	4.19	8	5.48	16	6.97	24	8.48
1	4.33	9	5.66	17	7.16	25	8.67
2	4.48	10	5.84	18	7.36	26	8.86
3	4.64	11	6.03	19	7.55	27	9.03
4	4.80	12	6.22	20	7.74	28	9.24
5	4.96	13	6.41	21	7.93	29	9.42
6	5.14	14	6.59	22	8.12	30	9.62
7	5.30	15	6.80	23	8.31		

C₂H₆, Ethane, v. p. 261C₃H₆, Propylene (89); cf. also (46)

$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$	$t, ^\circ\text{C}$	$10^{-6} \times K$
2	2.305	8	3.162	14	3.845
4	2.632	10	3.390	16	4.080
6	2.916	12	3.620	18	4.322

C₃H₈, Propane (47)C₄H₁₀, Butane (12, 34, 48, 93)

90% CH₄ + 10% C₂H₆, Pittsburgh natural gas; K , at 25°C = 2.95×10^7 (61)

C₂H₆, Ethane (104); cf. also (46)

<i>t</i> , °C	10 ⁻⁶ × <i>K</i>	<i>t</i> , °C	10 ⁻⁶ × <i>K</i>	<i>t</i> , °C	10 ⁻⁶ × <i>K</i>	<i>t</i> , °C	10 ⁻⁶ × <i>K</i>
0	9.547	10	14.386	20	19.978	30	25.976
1	9.972	11	14.936	21	20.562	35	29.097
2	10.400	12	15.477	22	21.157	40	32.18
3	10.838	13	16.032	23	21.757	45	35.15
4	11.294	14	16.593	24	22.360	50	37.94
5	11.772	15	17.163	25	22.970	60	42.89
6	12.264	16	17.734	26	23.579	70	47.38
7	12.776	17	18.308	27	24.162	80	50.23
8	13.304	18	18.872	28	24.765	90	52.2
9	13.849	19	19.432	29	25.388	100	52.6

(C₆H₁₄)_x, Casing-head gasoline; 81° Bé*K*, at 25°C = 7.9 × 10⁷ (61)(C₇H₁₆)_x, Motor gasoline; 66° Bé*K*, at 25°C = 5.5 × 10⁷ (61)CH₂O, Formaldehyde (33)CHF₃, Fluoroform (58)C₂H₂F₂, Acetylene difluoride (88)C₂H₅F, Fluoroethane (62)C₃H₅F, Fluoropropylene (58)C₃H₇F, Propyl fluoride (58)CH₃Cl, Methyl chloride; cf. also (46)

$$\log_{10} K = \frac{0.05223}{T} \times (-26382) + 10.224; \text{ range, 20 to } 60^\circ\text{C}$$

K, at 70°C = 1.52 × 10⁶; *K*, at 80°C = 1.77 × 10⁶ (70)

<i>P</i> , atm.	1	2	3	4	5	Lit.
<i>α</i> , 18°C	3.2	5.0	6.5	7.9	9.3	(70)

COS, Carbonyl sulfide (106); cf. also (46)

<i>t</i> , °C	0	5	10	15	20	25	30
10 ⁻⁶ × <i>K</i>	0.7020	0.8911	1.121	1.380	1.662	1.967	2.314

S(CH₂CH₂Cl)₂, Mustard gas; 0.684 g/l at 25°C (95)CH₃PH₂, Methylphosphine (37)HCN, Hydrogen cyanide; for 18°C, *v. p.* 365*K*, at 25°C = 4.81 × 10³ (49)CH₃NH₂, Methylamine; cf. also (46)*K*, at 12.5°C = 1575, *K*, at 25°C = 1730 (109); other amines (19)

Base	10 ⁻⁶ × <i>K</i>	Base	10 ⁻⁶ × <i>K</i>
NH ₃	0.739	C ₂ H ₅ NH ₂	0.765
CH ₃ NH ₂	0.692	(C ₂ H ₅) ₂ NH	0.877
(CH ₃) ₂ NH	0.805	C ₃ H ₇ NH ₂	0.804

LITERATURE

(For a key to the periodicals see end of volume)

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SOLUBILITIES OF GASES IN NON-AQUEOUS PURE LIQUIDS

A. G. LOOMIS

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An, Actinon (Ac. Em.). Concd. H₂SO₄ and organic solvents (52).Br₂. CCl₄, CH₃CO₂H and C₆H₅NO₂ (60, 61).Cl₂. CCl₄; *α*₁₈ = 30.2 (118); *α*₁₅ = 49.0 (60); *α*₁₃ (101).For *p*_{Cl₂} = 1 atm.; g/g = g Cl₂ per g solvent

<i>t</i> , °C	0	10	20	30	40	Lit.
g/g	0.196	0.140	0.103	0.081	0.064	(129)

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Solvent	<i>t</i> , °C	g/g	Lit.
Heptane	0	0.266	(129)
Silicon tetrachloride	0	0.169	
Ethylene dibromide	20	0.090	
	40	0.060	

Acetic anhydride, *α*₁₅ = 37.16 (60); (CHCl₂)₂ and C₂HCl₃ (26); CrO₂Cl₂ (5); SO₂Cl₂ (115).

H ₂			
Solvent	<i>t</i> , °C	10 ³ <i>α</i> _{<i>t</i>}	Lit.
H ₂ SO ₄ (95.6%)	20	10.20	(21)
Liquid air			(29)
NH ₃	-70		(112)

H₂.—(Continued)

Solvent	<i>t</i> , °C	10 ³ α_t	Lit.
CS ₂ , Carbon disulfide.....	20 25	31.3 34.4	(63)
CHCl ₃ , Chloroform.....			(1)
CH ₄ O, Methyl alcohol.....	20 25	84.0 86.6	(63); cf. (1)
C ₂ H ₄ O ₂ , Acetic acid.....	20 25	57.5 58.0	(63); cf. (140)
C ₂ H ₆ O, Ethyl alcohol (98.8%)....	20 25	80.3 81.9	(63); cf. (1, 18) (20, 48, 131)
C ₃ H ₆ O, Acetone.....	20 25	65.5 70.0	(63)
C ₄ H ₈ O ₂ , Ethyl acetate.....	20 25	73.4 78.1	(63)
C ₄ H ₁₀ O, Isobutyl alcohol.....	20 25	86.6 89.4	(63)
C ₄ H ₁₀ O, Ethyl ether.....	0 5 10 15	111.5 112.9 115.3 119.2	(22); cf. (1)
For <i>p</i> up to 1200 atm., <i>v.</i> (24)			
C ₅ H ₁₂ O, Amyl alcohol.....	20 25	32.9 27.6	(63); cf. (40)
C ₆ H ₅ NO ₂ , Nitrobenzene.....	20 25	32.9 34.0	(63); cf. (1)
C ₆ H ₆ , Benzene.....	20 25	65.9 69.3	(63); cf. (1, 30, 140)
C ₆ H ₇ N, Aniline.....	20 25	28.2 26.1	(63)
C ₇ H ₈ , Toluene.....	20 25	78.1 80.1	(63)
C ₇ H ₁₄ O ₂ , Amyl acetate.....	20 25	69.2 70.9	(63)
C ₈ H ₁₀ , Xylene.....	20 25	73.0 75.0	(63)
Other organic solvents.....			(35)
Transformer oil*.....	25 80	51 69	(86)
Russian petroleum.....	10 20	65.2 58.2	(43)
Kerosene.....			(95)
Cottonseed oil.....			(135)
Train oil (blubber).....			(135)

He. C₂H₅OH and C₆H₆ (104); HCO₂H, CHBr₃, CH₃CO₂H, C₆H₅NO₂ and cyclohexane (41).

N₂

Solvent	<i>t</i> , °C	10 ³ α_t	Lit.
O ₂ , liquid.....			(34); cf. (123)
H ₂ SO ₄ (95.6%).....	20	15.55	(21)
CS ₂ , Carbon disulfide.....	20 25	49.29 53.69	(63)
CHCl ₃ , Chloroform.....	20 25	119.5 123.5	(63)

* A mineral oil of Pennsylvania base, 96 % saturated hydrocarbons and distilling between 300 and 400°C. Commercially known as "Wemco A." $d_4^{25} = 0.840$; $d_4^{30} = 0.800$.

N₂.—(Continued)

Solvent	<i>t</i> , °C	10 ³ α_t	Lit.
CH ₄ O, Methyl alcohol.....	20 25	125.6 129.6	(63); cf. (72)
C ₂ H ₄ O ₂ , Acetic acid.....	20 25	109.2 109.0	(63)
C ₂ H ₆ O, Ethyl alcohol (99.8%)....	20 25	130.4 131.2	(63); cf. (18, 20, 48)
C ₃ H ₆ O, Acetone.....	20 25	128.9 133.8	(63)
	<i>p</i> N ₂ , mm	$\alpha_{25.05}$	
C ₄ H ₈ O ₂ , Isobutyric acid.....	300 400 500 600 700 800 900	1498 1503 1508 1512 1517 1521 1527	(32)
	<i>t</i> , °C	10 ³ α_t	
C ₄ H ₈ O ₂ , Ethyl acetate.....	20 25	156.3 158.2	(63)
C ₄ H ₁₀ O, Ethyl ether.....	0 10	258.0 247.1	(22)
C ₅ H ₁₂ O, Amyl alcohol.....	20 25	112.6 112.2	(63)
C ₆ H ₅ NO ₂ , Nitrobenzene.....	20 25	56.67 57.30	(63)
C ₆ H ₆ , Benzene.....	20 25	103.8 106.2	(63)
C ₆ H ₇ N, Aniline.....	20 25	27.88 28.16	(63)
C ₆ H ₁₂ O ₂ , Isobutyl acetate.....	20 25	158.5 158.9	(63)
C ₇ H ₈ , Toluene.....	20 25	110.5 113.1	(63)
C ₇ H ₁₄ O ₂ , Amyl acetate.....	20 25	140.9 141.3	(63)
C ₈ H ₁₀ , Xylene.....	20 25	110.4 111.5	(63)
Various organic solvents.....			(35)
Transformer oil*.....	25 80	84.8 91.6	(86)
Russian petroleum.....	10 20	135 117	(43)
Kerosene.....			(95)

O₂

Solvent	<i>t</i> , °C	10 ³ α_t	Lit.
Liquid air.....			(6)
H ₂ SO ₄ (95.6%).....	20	29.45	(21)
CCl ₄ , Carbon tetrachloride.....	25 17.8	225 230	(88) (36)
CHCl ₃ , Chloroform.....	16.3	205	(36)
CH ₄ O, Methyl alcohol.....	18.8	175	(36)
$\lambda = 0.31864 - 0.002572t - 0.042866t^2$; range, 5 to 30°C (72)			
C ₂ H ₂ Cl ₄ , 1, 1, 2, 2-Tetrachloroethane.....	18.3	100	(36)
C ₂ H ₆ O, Ethyl alcohol (96%).....	19.8	143	(36)
$\alpha = 0.23370 - 0.0374688t + 0.03288t^2$ (99.7% alcohol); range, 0 to 24°C (131)			

* See note to H₂.

Solvent

Solvent	t , °C	$10^3\alpha_t$	Lit.
C ₃ H ₆ O, Acetone.....	19.3	207	(36)
$\lambda = 0.2997 - 0.00318t - 0.0412t^2$; range, 5 to 25°C			(72)
C ₄ H ₈ O ₂ , Ethyl acetate.....	20	163	(36)
C ₄ H ₁₀ O, Ethyl ether.....	20.3	415	(36)
	0	423.5	(22)
	10	406.6	(22)
C ₅ H ₅ N, Pyridine.....	18.5	99	(36)
C ₅ H ₁₂ O, Isoamyl alcohol.....	17.3	163	(36)
C ₆ H ₅ NO ₂ , Nitrobenzene.....	18.5	70	(36)
C ₆ H ₆ , Benzene.....	19	163	(36)
C ₇ H ₈ , Toluene.....	18	168	(36)
C ₈ H ₁₀ , Xylene.....	16	169	(36)
C ₁₀ H ₁₂ , Tetralin.....	17.3	94	(36)
Other organic solvents.....			(35)
Petroleum ether, fraction to 65°C.	18.5	409	(36)
	$d = 0.668$		
Benzine, fraction 65 to 100°C.....	18	292	(36)
	$d = 0.709$		
Paraffin oil.....	18	114	(36)
	$d = 0.881$		
Transformer oil*.....	25	156.2	(86)
	80	148.5	
Russian petroleum.....	10	229	(43)
	20	202	
Kerosene (commercial).....	18	159	(36); <i>cf.</i>
	$d = 0.809$		(95)

* See note to H₂, p. 262.

O₃. CCl₄, $P = 760$ mm, $t = 15^\circ\text{C}$, 0.0064 g O₃ per l of solution (37).

Rn, Radon					
H_2SO_4 (16)		CH_2O_2 , Formic acid (53)		$t, ^\circ\text{C}$	α
$t, ^\circ\text{C}$	α	$t, ^\circ\text{C}$	α	(53)	
CS_2 (116)				2.0	9.41
-18	53.85	19.8	4.04	15.5	6.84
-15	49.52			29.2	5.34
-10	43.08	CH_4O , Methyl alcohol (53)		37.8	4.85
-5	37.69	3.8	7.33	<i>v. also</i> (16)	
0	33.30	16.2	5.39	$\text{C}_3\text{H}_6\text{O}$, Acetone (116)	
+5	29.46			-20	11.98
10	26.24	$\text{C}_2\text{H}_4\text{O}_2$, Acetic acid (53)		-15	10.79
15	23.13	12.6	4.62 (?)	-10	9.65
20	21.43	17.5	4.71	-5	8.66
25	19.61	21.0	4.62	0	7.90
30	18.11	25.8	4.31	+5	7.27
40	15.79	27.1	4.12	10	6.66
CHCl_3 (116)		$\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol (116)		15	6.16
-20	32.05	-18	12.20	20	5.68
-15	28.04	-15	11.32	25	5.41
-10	24.70	-10	10.07	30	5.04
-5	22.00	-5	9.07	40	4.54
0	19.70	0	8.24	$\text{C}_3\text{H}_6\text{O}_2$, Propionic acid (53)	
+5	17.77	+10	6.69	20.7	6.79
10	16.11	20	5.62	29.7	6.15
15	14.79	30	4.78	$\text{C}_3\text{H}_8\text{O}$, <i>n</i> -Propyl alcohol (53)	
20	13.60	40	4.12	13.6	8.69
25	12.64	50	3.60		
30	11.71	(17)			
35	10.99	14	6.98		
40	10.38				
45	9.87				
50	9.47				

C ₃ H ₈ O, Isopropyl alcohol (53)	
<i>t</i> , °C	α
14.3	6.91
27.2	5.60

C ₃ H ₈ O ₃ , Glycerol	
(81)	
3	2.9
10	2.1
20	1.4
30	0.9
50	0.1

C ₄ H ₈ O ₂ , <i>n</i> -Butyric acid (53)	
19.8	7.86
19.9	8.18

C ₄ H ₈ O ₂ , Isobutyric acid (53)	
19.8	8.44
19.9	8.56

C ₄ H ₈ O ₂ , Ethyl acetate (116)	
-18	14.56
-15	13.12
-10	11.83
- 5	10.49
0	9.43
+ 5	8.53
10	7.74
15	7.09
20	6.50
25	6.00
30	5.60
35	5.23
40	4.92
50	4.41
60	4.02

$C_4H_{10}O$, Ethyl ether (116)	
-18	31.15
-10	25.12
- 5	22.31
0	19.90
+ 5	17.97
10	16.30
15	14.88
20	13.79
25	12.83
30	11.98

C₄H₁₀O, *n*-Butyl
alcohol (53)
11.2 | 9.40

C₄H₁₀O, Isobutyl
alcohol (53)

3.4	10.29
16.3	7.94

$C_4H_{10}O$, *sec.*-Butyl
alcohol (53)
16.7 | 7.14

C ₅ H ₁₂ O, Amyl alcohol (17)	
<i>t</i> , °C	α
14	8.86

C ₅ H ₁₂ O, Isoamyl alcohol (53)	
0.1	11.33
6.9	9.78
15.0	8.55
25.1	7.20

C ₆ H ₆ , Benzene (128)	
6	20.020
8	17.650
10	15.730
12	14.180
14	12.835
16	11.750
18	10.810
20	9.845
22	8.975
24	8.275
26	7.643
28	7.045
30	6.516
35	5.387
40	4.468
45	3.796
50	3.360
55	3.072
60	2.868
65	2.716
70	2.590
73	2.523

C ₆ H ₁₄ , <i>n</i> (?) - Hexane (116)	
-18	37.68
-15	34.18
-10	29.58
- 5	26.18
0	23.40
+ 5	21.02
10	18.91
15	16.97
20	15.19
25	13.56
30	11.98

C ₇ H ₈ , Toluene (55, 116)	
-18	28.91
-10	23.36
- 5	20.78
0	18.50
+ 5	16.49
10	14.76
15	13.18
20	11.83
25	10.63
30	9.55
35	8.62
40	7.81
50	6.42
60	5.26
(17)	
14	13.0

C ₇ H ₁₄ O ₂ , Amyl acetate (81)	
<i>t</i> , °C	<i>α</i>
-20	39.5
0	21.2
+20	14.2
50	7.8
70	4.3

C ₈ H ₁₀ , Xylene (81)	
-20	27.5
0	19.6
+20	13.6
50	7.7
70	4.9

Other organic sol-
vents, *v.* (89, 105,
133).

Colza oil (81)	
- 3	51.2
0	46.9
+10	33.9
20	26.1
30	22.2
40	19.2
50	16.6
75	10.9
100	6.2
200	3.3

Olive oil	(81)
0	45.9
15	29.5
30	22.1
40	18.3
60	11.4

Poppy oil (81)	
- 5	50.5
0	44.2
+10	34.3
20	27.8
30	22.9
40	19.1
50	16.0
60	13.4
70	11.5
80	9.9
90	8.4

Turpentine (81)	
-21	45.5
0	23.1
+20	15.9
50	7.5
65	4.1

Petroleum ether (16)	
Vaseline (81)	
-10	23.9
0	15.2
+15	10.7
25	8.9
35	7.7
50	6.6
Kerosene (55)	

Tn, Thoron (Th. Em.)

H₂SO₄, C₂H₅OH and petroleum ether (16); H₂SO₄ and organic solvents (52); kerosene (64)

Xe

C₆H₇N, Aniline (2)

<i>t</i> , °C	10	20	30	40	50
α	0.669	0.500	0.453	0.428	0.406

Air

Liquid chlorine: $\alpha_{-30} = 0.30$; $\alpha_{-2} = 0.32$, $\alpha_{30} = 0.37$, for p_A between 1 and 7 atm. (108); 95.6% H₂SO₄; $\alpha_{20} = 0.01703$ (21); cf. (132).

CHCl₃, C₆H₅NO₂, C₆H₆, CH₃OH, C₂H₅OH, (C₂H₅)₂O, *v.* (1); C₆H₆, *v.* (30); C₂H₅OH, C₆H₆, kerosene, oil of lavender, and turpentine, *v.* (107.5).

Solubility of air in liq. C₂H₅Cl at 11° is about 3 times its solubility in H₂O at 11° (59.5).

C₄H₁₀O, Ethyl ether (22); cf. (1)

<i>t</i> , °C	α
0	0.290
10	0.277
15	0.271

B-TABLE

HCl

CHCl₃ at 10°C (139)

<i>t</i> , °C	g HCl/g soln.; <i>P</i> = 760 mm		
	CH ₃ OH (75)	C ₂ H ₅ OH (75)	(C ₂ H ₅) ₂ O (117); cf. (62)
-10	0.546		0.375
-5			0.370
0	0.519	0.454	0.356
+5		0.445	0.331
10	0.492	0.434	0.304
15		0.423	0.276
20	0.464	0.410	0.249
25		0.398	0.222
30	0.435	0.386	0.195
32		0.381	

SO₂ (74)

<i>t</i> , °C	cm ³ SO ₂ (S. T. P.) per cm ³ sat. soln.; <i>P</i> = 756–760 mm				<i>t</i> , °C	(CH ₃ CO) ₂ O†
	C ₆ H ₆	C ₆ H ₅ NO ₂	C ₇ H ₈	C ₇ H ₇ NO ₂ *		
15		108.94		101.73	-5	68.6
20		93.54	76.08	82.56	0	52.2
25		79.73	56.00	67.24	+5	46.8
30	44.60	66.47	43.52	56.22	10	43.0
40	30.02	46.18	32.74	41.45	15	39.9
50	19.95	34.53	25.70	31.05	20	37.2
60	11.89	27.50	19.75	23.05	25	34.6
					30	31.9

* *o*-Nitrotoluene.

† Acetic anhydride.

CHCl₃, Chloroform (73)

<i>p</i> SO ₂ , mm Hg	g SO ₂ /l soln.		<i>p</i> SO ₂ , mm Hg	g SO ₂ /l soln.	
	0°	25°		0°	25°
2.5	0.73		100.0	34.6	14.28
5.0	1.52	0.69	150.0	53.8	21.73
10.0	3.08	1.25	200.0	74.0	29.51
15.0		1.93	219	82.17	
25.0	7.97	3.34	300.0		45.9
50.0	16.60	6.98	400.0		62.9
			488.8		78.39

Alcohols (75); cf. (18, 20). Wt. % SO₂ in solution, *P* = 760–770 mm Hg

<i>t</i> , °C	0	5	10	15	20	25
CH ₃ OH.....	71.1	63.5	55.8	48.3	40.8	33.2
C ₂ H ₅ OH.....	53.5	47.8	42.2	36.6	31.0	25.5

H₂SO₄ (33); SO₂Cl₂, formic and acetic acids and acetone (115).

H₂S

Liquid S (100); C₂H₅OH (18, 20, 48); (C₂H₅)₂O (97); pyridine at 22° (113); other organic solvents (42).

H₂Se

Liquid Se (99).

N₂OValues of α^* (69)

<i>t</i> , °C	CHCl ₃	C ₂ H ₂ Br ₂	CH ₃ OH	CH ₃ -CO ₂ H	C ₂ H ₅ OH	(CH ₃) ₂ -CO
18	5.35	2.69	3.17	4.69	2.88	5.91
20	5.22	2.61	3.10	4.52	2.79	5.63
22	5.07	2.54	3.03	4.35	2.70	5.35
24	4.87	2.47	2.96	4.18	2.61	5.06
26	4.63	2.40	2.88	4.01	2.52	4.73
28	4.38	2.34	2.79	3.85	2.44	4.39
30	4.12	2.27	2.69	3.70	2.35	4.02
32	3.84	2.21	2.58	3.56	2.27	3.64
34	3.58	2.15		3.41	2.19	3.25
36	3.27	2.09		3.31		2.85

* As computed by Manchot (84.7), assuming Henry's and Dalton's laws.

<i>t</i> , °C	C ₅ H ₁₂ O, Isoamyl alcohol	C ₅ H ₅ N, Pyridine	C ₆ H ₇ N, Aniline	C ₇ H ₆ O, Benzaldehyde	C ₇ H ₁₄ O ₂ , <i>n</i> -Amyl acetate
18	2.36		1.41	3.03	4.92
20	2.30	3.34	1.38	2.94	4.79
22	2.24	3.24	1.34	2.85	4.66
24	2.18	3.14	1.31	2.76	4.53
26	2.12	3.05	1.28	2.67	4.40
28	2.07	2.95	1.24	2.58	4.27
30	2.01	2.86	1.21	2.50	4.14
32	1.96	2.77	1.18	2.43	4.02
34	1.92	2.69	1.16	2.36	3.90
36	1.87	2.60	1.13	2.29	3.80

Russian petroleum; $\alpha_{10} = 2.49$; $\alpha_{20} = 2.11$ (43); C₂H₅OH (9, 18, 20, 48); olive oil and sesame oil (90, 138); kerosene (95); various organic solvents (35, 42); general discussion (14).

NO

H₂SO₄ (79, 80, 84.5, 106, 132); C₂H₅OH (18, 20, 48); alcoholic FeCl₂ solution (85); general discussion (14).

N₂O₄HNO₃; *P* = 762.5 mm Hg (98) (See also p. 304)

<i>t</i> , °C	$\frac{g\ N_2O_4}{g\ HNO_3}$	<i>t</i> , °C	$\frac{g\ N_2O_4}{g\ HNO_3}$
22	∞	55	0.121
22.8	2 layers	60	0.085
33	0.370	65	0.055
35	0.340	70	0.032
40	0.274	75	0.016
45	0.216	78.5	0
50	0.165		

NH₃

Alcohols: *P* = 760 mm Hg; Wt. % NH₃ in the CH₃OH solution; g NH₃ per 100 cm³ of the C₂H₅OH solution (28, 75)

<i>t</i> , °C	0	5	10	15	20	25	30
CH ₃ OH.....	29.3	26.7	24.2	21.7	19.2	16.5	14.0
C ₂ H ₅ OH.....	13.05	12.00	10.75	9.24	7.55	5.78	4.0

(C₂H₅)₂O; $\alpha_0 = 17.13$; $\alpha_{10} = 11.91$; $\alpha_{15} = 9.74$ (22).

CHCl_3 (8); $\text{C}_2\text{H}_5\text{OH}$ (4, 93); C_6H_6 (126); $\text{C}_6\text{H}_5\text{CH}_3$ (46); ethyl, propyl and isobutyl alcohols (96); quinoline (102).
 SbH_3 in organic liquids (124)

C-TABLE. THE C-ARRANGEMENT

Solubilities of organic compounds

CO, Carbon monoxide

Solvent	$t, ^\circ\text{C}$	$10^3\alpha$	Lit.
H_2SO_4 (95.6%)	20	21.64	(21)
CS_2 , Carbon disulfide	20	75.58	(63)
	25	76.17	(63)
	25	87.9	(119)
CHCl_3 , Chloroform	20	176.8	(63)
	25	179.0	(63)
	25	189	(119)
CH_3O , Methyl alcohol	20	170.5	(63)
	25	179.1	(63)
	25	180	(119)
$\text{C}_2\text{H}_4\text{Cl}_2$, Ethylene chloride	20	135	(119)
$\text{C}_2\text{H}_4\text{O}_2$, Acetic acid	20	157.4	(63)
	25	157.0	(63)
	25	158	(119)
$\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol; cf. (18, 20)	20	177.1	(63)
	25	176.0	(63)
	25	176	(119)
$\text{C}_3\text{H}_6\text{O}$, Acetone	20	198.3	(63)
	25	203.8	(63)
	25	218	(119)
$\text{C}_3\text{H}_8\text{O}_3$, Glycerol	25	Very small	(119)
$\text{C}_4\text{H}_8\text{O}_2$, Ethyl acetate	20	225.4	(63)
	25	230.5	(63)
$\text{C}_4\text{H}_{10}\text{O}$, Ethyl ether	0	361.8	(22)
	10	370.6	
For P up to 1200 atm			(24)
$\text{C}_5\text{H}_{12}\text{O}$, Amyl alcohol	20	159.0	(63)
	25	157.0	(63)
$\text{C}_6\text{H}_5\text{NO}_2$, Nitrobenzene	20	84.84	(63)
	25	85.81	(63)
	25	85	(119)
C_6H_6 , Benzene	20	153.3	(63)
	25	156.4	(63)
	25	159	(119)
$\text{C}_6\text{H}_7\text{N}$, Aniline; cf. (77)	25	49	(119)
	20	47.10	(63)
	25	49.09	(63)
$\text{C}_6\text{H}_{12}\text{O}_2$, Isobutyl acetate	20	215.6	(63)
	25	216.7	(63)
C_7H_8 , Toluene	20	162.3	(63)
	25	165.6	(63)
	25	167	(119)
$\text{C}_7\text{H}_{14}\text{O}_2$, Amyl acetate	20	196.4	(63)
	25	196.1	(63)
C_8H_{10} , Xylene	20	162.5	(63)
	25	163.2	(63)
Various organic solvents, v. (35, 107)			
Russian petroleum	10	134	(43)
	20	123	
Transformer oil "Wemco A"*	25	186	(86)
	80	153	

* See note to H₁, p. 262.

CO_2
 95.6% H_2SO_4 (21);
 cf. (84)

$t, ^\circ\text{C}$	α
20	0.9230
CCl_4 (63)	
15	2.467
20	2.331
25	2.102
CS_2 (63); cf. (136)	
15	0.8954
20	0.8282
25	0.7969
CHCl_3 ; cf. (1, 30, 68, 136.5)	
(63)	
15	3.750
20	3.430
25	3.142
(69)	
18	3.59
20	3.47
22	3.34
24	3.22
26	3.09
28	2.96
30	2.81
32	2.66
34	2.50
36	2.37
CH_3O , Methyl alcohol (63)	
15	4.366
20	3.918
25	3.515
(69)	
18	3.41
20	3.33
22	3.25
24	3.16
26	3.07
28	2.97
30	2.87
32	2.76
34 cf. (1)	2.64
$t = -78^\circ\text{C}; d_4^{-78} = 0.884$ (109, 122)	
$p_{\text{CO}_2}, \text{mm}$	
100	167.4
200	168.1
300	169.4
400	171.1
500	172.7
600	174.8
700	177
740	177.5
$t = -59^\circ\text{C}; d_4^{-59} = 0.866$	
100	54.2
200	54.5
300	54.7
400	54.9
500	55.1
600	55.2
700	55.3

$\text{C}_2\text{H}_4\text{Br}_2$, Ethylene bromide
 (63)

$t, ^\circ\text{C}$	α
15	2.298
20	2.137
25	1.976
(69)	
18	2.18
20	2.12
22	2.06
24	2.00
26	1.94
28	1.85
30	1.82
32	1.76
34	1.71
36	1.65
$\text{C}_2\text{H}_4\text{Cl}_2$, Ethylene chloride (63)	
15	3.850
20	3.536
25	3.229
$\text{C}_2\text{H}_4\text{O}_2$, Acetic acid (glacial) (63)	
15	5.322
20	4.779
25	4.287
(69)	
18	5.07
20	4.87
22	4.69
24	4.51
26	4.32
28	4.15
30	3.97
32	3.80
34	3.66
36	3.53
$\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol (97%) (63)	
15	2.967
20	2.724
25	2.479
(69)	
18	2.77
20	2.67
22	2.59
24	2.50
26	2.41
28	2.32
30	2.23
32	2.15
34	2.07
(99%) (15)	
-65.3	39.38
-25	8.86
-20	7.67
-10	5.75
0	4.44
+10	3.57
20	3.00
30	2.59

$\text{C}_2\text{H}_6\text{O}$.—(Cont'd.)

$t, ^\circ\text{C}$	α
40	2.23
50	1.89
$t = -78^\circ\text{C}; d_4^{-78} = 0.872$ (109, 122)	
$p_{\text{CO}_2}, \text{mm}$	
100	95.75
200	97.15
300	98.65
400	100.1
500	101.6
600	103.1
700	104.6
$t = -59^\circ\text{C}; d_4^{-59} = 0.856$	
100	34.7
200	34.8
300	35.1
400	35.27
500	35.45
600	35.63
700	35.78
740	35.84
(110)	
$p_{\text{CO}_2}, \text{atm.}$	
$t = 20^\circ\text{C}$	
30	98.9
35	119.0
40	140.2
45	158.7
50	176.1
$t = 35^\circ\text{C}$	
30	69.98
35	85.4
40	100.9
45	114.9
50	127.9
55	140.2
60	153.8
65	169.4
70	189.5
$t = 60^\circ\text{C}$	
40	61.3
45	71.3
50	81.2
55	91.0
60	101.1
65	110.6
70	119.2
75	127.1
80	134.2
85	140.7
90	146.9
95	153.1
100	159.2
$t = 100^\circ\text{C}$	
50	32.9
55	44.6
60	50.2
65	58.6
70	66.9
75	75.1
80	82.3
85	88.8
90	95.0

CO ₂ —(Continued)		C ₃ H ₆ O ₂ , Propionic acid (63)		C ₃ H ₈ O.—(Continued)		C ₄ H ₈ O ₂ —(Cont'd.)		C ₄ H ₁₀ O, Ethyl ether (22)		C ₅ H ₅ N.—(Cont'd.)	
C ₂ H ₆ O.—(Continued)		<i>t</i> , °C	α	<i>p</i> CO ₂ , atm.	β'	<i>p</i> CO ₂ , mm	α	<i>t</i> , °C	α	<i>t</i> , °C	α
<i>t</i> = 100°C.—(Continued)		15	4.538	35	46.5	<i>t</i> = -59°C; <i>d</i> ₄ ⁻⁵⁹ = 0.994		0	7.330	28	3.11
<i>p</i> CO ₂ , atm.	β'	20	4.106	40	55.1	100	83.3	10	5.831	30	3.00
95	100.9	25	3.736	45	64.2	200	83.9	15	5.180	32	2.89
100	106.1	C ₃ H ₆ O ₂ , Methylacetate (109, 122)		50	73.3	300	84.2	(130)		34	2.78
105	111.3	<i>t</i> = -78°C;		55	82.6	400	85.1	<i>t</i> , °C	$\frac{\text{g CO}_2}{\text{g Ether}}$	36	2.68
110	116.5	<i>d</i> ₄ ⁻⁷⁸ = 1.056		60	92.2	500	86.2	-78.6	0.551	C ₅ H ₁₁ Br, Amyl bromide (63)	
115	121.5	<i>p</i> CO ₂ , mm	α	65	102.2	600	87.5	-70	0.320	15	2.657
120	125.5	50	313.8	70	111.8	700	88.9	-60	0.192	20	2.458
125	128.4	100	313.9	75	121.5	(110)		-50	0.125	25	2.249
130	130.7	200	314.1	80	131.3	<i>p</i> CO ₂ , atm.	β'	-40	0.083	C ₅ H ₁₁ Cl, Amyl chloride (63)	
135	132	300	314.6	85	141.6	<i>t</i> = 20°C		-30	0.057	15	3.188
<i>See further (1, 9, 13, 18, 20, 48, 92).</i>		400	315.8	90	152.7	24	141.8	-20	0.039	20	2.914
C ₃ H ₆ Br ₂ , Propylene bromide (63)		500	318.2	95	165.1	30	174.1	-10	0.026	25	2.666
<i>t</i> , °C	α	600	321.7	<i>t</i> = 100 °C		35	193.7	0	0.019	C ₅ H ₁₂ O, Amyl alcohol (63)	
15	2.451	650	323.6	38	17.16	40	209.2	+10	0.017	15	1.951
20	2.286	<i>t</i> = -59°C;		40	21.74	<i>t</i> = 35°C		15.2 cf.(1)	0.016	20	1.809
25	2.108	<i>d</i> ₄ ⁻⁵⁹ = 1.032		45	32.28	29	124.5	(110)		25	1.677
C ₃ H ₆ Cl ₂ O, Dichlorohydrin (63)		100	97.5	50	40.85	30	128.5	<i>p</i> CO ₂ , atm.	β'	(69)	
15	1.928	200	98.1	55	48.64	35	148.6	<i>t</i> = 35°C		20	1.78
20	1.786	300	98.5	60	55.74	40	165.1	43	175.2	22	1.74
25	1.658	400	99.0	65	62.7	45	177.7	45	179.2	24	1.70
C ₃ H ₆ O, Acetone (63)		500	99.6	70	69.5	50	185.0	50	189.8	26	1.65
20	6.449	600	100.1	75	76.1	55	187.7	55	200.4	28	1.60
25	5.767	700	100.8	80	82.3	60	189.1	58	207.1	30	1.56
(69)		(63)		85	88.5	<i>t</i> = 60°C		<i>t</i> = 60°C		32	1.51
20	6.50	<i>t</i> , °C	α	90	94.7	29	85.6	48	135.4	34	1.46
22	6.26	25	5.949	95	100.8	30	88.5	50	139.5	C ₆ H ₃ Cl ₃ , Trichlorobenzene (63)	
24	5.98	C ₃ H ₈ O, Propyl alcohol (63)		100	106.8	35	102.6	55	149.8	25	1.505
26	5.68	25	2.289	105	112.7	40	114.3	60	157.6	C ₆ H ₅ Br, Bromobenzene (63)	
28	5.33	(110)		110	118.5	45	124.6	65	163.6	15	1.983
30	4.95	<i>p</i> CO ₂ , atm.	β'	115	124.4	50	133.9	70	168.9	20	1.830
32	4.55	<i>t</i> = 20°C		116	125.5	55	142.8	75	174.1	25	1.688
34	4.14	19	51.11	C ₃ H ₈ O ₃ , Glycerol (63)		60	151.0	80	179.4	(110)	
<i>t</i> = -78°C, <i>d</i> ₄ ⁻⁷⁸ = 0.900 (109, 122)		20	52.46	<i>t</i> , °C	α	65	158.5	85	184.6	<i>p</i> CO ₂ , atm.	β'
<i>p</i> CO ₂ , mm	α	25	66.43	25	0.0277	70	165.5	90	189.9	<i>t</i> = 20°C	
50	275.2	30	81.09	C ₄ H ₆ O ₃ , Acetic anhydride (63)		75	172.6	95	195.2	19	44.82
100	277.3	35	96.76	15	5.894	78	176.6	97	197.4	20	47.57
200	281.9	40	115.21	20	5.330	<i>t</i> = 100°C		<i>t</i> = 100°C		25	61.59
300	286.8	45	139.11	25	4.769	39	57.79	58	71.4	30	77.48
400	291.6	50	166.0	35		40	60.0	60	76.2	35	95.41
500	296.2	C ₄ H ₈ O ₂ , <i>n</i> -Butyric acid (63)		40		45	71.2	65	86.8	40	113.58
600	300.9	<i>t</i> = 35°C		45		50	80.9	70	95.1	45	131.33
650	303.5	19	33.55	50		55	89.2	75	101.9	50	150.2
<i>t</i> = -59°C; <i>d</i> ₄ ⁻⁵⁹ = 0.879		20	35.68	<i>t</i> , °C	α	60	96.4	80	108.1	<i>t</i> = 35°C	
100	85.7	25	47.1	15	3.871	65	102.7	85	113.7	19	36.65
200	86.7	30	58.3	20	3.510	70	108.3	90	119.2	20	38.25
300	88.3	35	70.5	25	3.186	75	113.7	95	124.7	25	46.9
400	89.3	40	83.6	C ₄ H ₈ O ₂ , Ethyl acetate (109, 122)		80	118.6	97	127	30	56.2
500	90.6	45	97.3	<i>p</i> CO ₂ , mm	α	85	123.3	C ₅ H ₅ N, Pyridine (63)		35	67.2
600	93.0	50	111.9	<i>t</i> = -78°C;		90	127.9	<i>t</i> , °C	α	40	79.5
700	92.9	55	129.1	<i>d</i> ₄ ⁻⁷⁸ = 1.017		95	132.5	15	4.068	45	92.2
<i>t</i> = 60°C		60	148.5	50	247.9	97	134.2	20	3.598	50	104.7
19	19.00	65	170.1	100	248.6	C ₄ H ₉ Cl, Isobutyl chloride (63)		25	3.349	55	117.4
20	20.58	70	194.1	200	250.6	<i>t</i> , °C	α	(69)		60	131.1
25	29.07	75	220.3	300	253.3	15	3.468	18	3.71	65	147.7
30	37.8	80	246	400	256.6	20	3.157	20	3.59	70	166.6
<i>t</i> = 60°C		C ₄ H ₈ O ₂ , Ethyl acetate (109, 122)		500	260.5	25	2.845	22	3.47	75	188.4
19	19.00	<i>p</i> CO ₂ , mm	α	600	265.1	C ₄ H ₁₀ O, Isobutyl alcohol (63)		24	3.34	78	203.4
20	20.58	<i>t</i> = -78°C;		650	267.6	15	1.979	26	3.22	<i>* β' = cm³ gas (S. T. P.) at <i>t</i> and <i>p</i>.</i>	
25	29.07	<i>d</i> ₄ ⁻⁷⁸ = 1.017		<i>t</i> = 60°C		20	1.830	<i>* β' = cm³ gas (S. T. P.) at <i>t</i> and <i>p</i>.</i>			
30	37.8	50	247.9	19	19.00	25	1.694				
<i>t</i> = 60°C		60	148.5	20	20.58						
100	85.7	65	170.1	25	29.07						
200	86.7	70	194.1	30	37.8						
300	88.3	75	220.3								
400	89.3	80	246								
500	90.6										
600	93.0										
700	92.9										

C ₆ H ₅ Br.—(Cont'd.)		C ₆ H ₅ Cl.— (Continued)		C ₆ H ₅ NO ₂ .— (Continued)		C ₆ H ₆ .—(Continued)		C ₆ H ₁₂ O ₂ , <i>n</i> -Amyl formate (63)		C ₇ H ₈ .—(Continued)	
<i>p</i> CO ₂ , atm.	<i>β'</i> *	<i>p</i> CO ₂ , atm.	<i>β'</i> *	<i>p</i> CO ₂ , atm.	<i>β'</i> *	<i>p</i> CO ₂ , atm.	<i>β'</i> *	<i>t</i> , °C	<i>α</i>	<i>p</i> CO ₂ , atm.	<i>β'</i> *
<i>t</i> = 60°C		<i>t</i> = 60°C									
19	23.78	19	27.9	35	97.8	45	144.8	15	4.404	60	105.0
20	25.03	20	29.3	40	112.6	50	166.1	20	4.034	65	114.1
25	31.44	25	36.6	45	128.9	55	186.7	25	3.688	70	123.2
30	37.84	30	44.8	48	139.1	60	207			75	132.2
35	44.3	35	53.5	50	146.1	65	225	C ₆ H ₁₂ O ₂ , Isobutyl acetate (63)		80	140.7
40	50.9	40	62.1	<i>t</i> = 35°C		<i>t</i> = 60°C		20	4.629	85	148.7
45	57.7	45	71.0	20	39.40	19	20	25	4.298	90	156.3
50	64.6	50	80.0	25	49.66	20	23			95	163.9
55	71.5	55	88.8	30	60.5	25	37	C ₇ H ₆ O, Benzalde- hyde (63)		97	166.9
60	78.3	60	96.5	35	71.7	30	51	15	3.132	<i>t</i> = 100°C	
65	85.0	65	103.2	40	82.1	35	63.6	20	2.848	30	21.89
70	91.8	70	109.5	45	92.2	40	76.4	25	2.603	35	29.43
75	98.9	75	115.6	50	102.8	45	89.7			40	36.7
80	106.3	80	121.5	55	116.0	50	103.1	(69)		45	43.5
85	113.9	85	128.1	60	129.9	55	116.3	18	2.88	50	50.3
90	122.0	90	135.4	65	145.4	60	129.0	20	2.78	55	57.1
95	130.4	95	143.2	70	161.7	65	141.2	22	2.67	60	63.2
100	139.5	100	151.4	75	183.8	70	153.1	24	2.58	65	68.9
105	149.6	105	159.8	78	197.1	75	165.1	26	2.49	70	74.7
107	153.9	107	168.1	<i>t</i> = 60°C		80	177.5	28	2.41	75	80.4
<i>t</i> = 100°C		<i>t</i> = 100°C		20	24.5	85	189.9	30	2.33	80	86.2
29	22.8	30	24.9	25	28.9	90	202.0	32	2.26	85	91.9
30	23.7	35	30.6	30	33.3	95	214.3	34	2.19	90	97.6
35	28.3	40	36.0	35	37.9	96	216.8	36	2.11	95	103.3
40	32.9	45	41.4	40	42.6	<i>t</i> = 100°C				100	108.6
45	37.8	50	46.6	45	47.5	38	29.1	C ₇ H ₇ Cl, Benzyl chlo- ride (63)		105	113.4
50	42.5	55	51.8	50	52.1	40	32.1	15	2.066	110	117.5
55	47.1	60	56.7	55	56.7	45	39.8	20	1.931	115	121.0
60	51.6	65	61.8	60	60.8	50	48.5	25	1.775	120	123.8
65	56.1	70	66.5	65	63.9	55	58.3			125	126.2
70	60.5	75	70.9	70	65.9	60	68.1	C ₇ H ₈ , Toluene (63)		130 cf. (46)	128.4
75	64.9	80	74.9	75	67.1	65	78.6	15	2.424	C ₇ H ₉ N, Toluidine (63)	
80	69.1	85	78.8	78	67.6	70	90.0	20	2.260	<i>t</i> , °C | <i>α</i>	
85	73.4	90	82.3	<i>t</i> = 100°C		75	102.5	25	2.112	Ortho	
90	77.6	95	85.9	20	18.2	80	114.0			15	1.459
95	81.7	100	89.3	25	23.6	85	125.1	(110)		20	1.372
100	85.7	105	92.6	30	28.9	90	136.3	<i>p</i> CO ₂ , atm.	<i>β'</i> *	25	1.265
105	89.9	110	95.7	35	34.1	95	147.2	<i>t</i> = 20°C		Meta	
110	94.2	115	98.6	40	38.6	100	156.6	20	54.99	15	1.640
115	98.6	120	101.2	45	42.6	105	165.9	25	75.43	20	1.473
116	99.4	125	103.6	50	46.0	110	174.3	30	97.5	25	1.316
C ₆ H ₅ Cl, Chloroben- zene (110)		126	104.5	55	49.0	115	181.4	35	120.4	C ₇ H ₁₄ O ₂ , Amyl ace- tate (63)	
<i>t</i> = 20°C		(63)		60	51.9	116	182.7	40	148.4		
19	55.37	<i>t</i> , °C	<i>α</i>	65	54	C ₆ H ₇ N, Aniline (63)		45	185.7		
20	58.19	15	2.447	70	57	<i>t</i> = 20°C		50	224.4		
25	72.91	20	2.255	75	60	15	2.569	<i>t</i> = 35°C		15	4.587
30	89.03	25	2.075	78 cf. (1)	61	20	2.367	20	44.32	20	4.110
35	107.9	C ₆ H ₅ I, Iodobenzene (63)		C ₆ H ₆ , Benzene (110)		25 cf. (1, 30)	2.222	25	58.41	25	3.774
40	129.2	15	1.365	15	44.40	<i>t</i> = 35°C		30	72.1	(69)	
45	151.8	20	1.277	20	67.09	15	1.451	35	85.9	18	4.49
50	177.0	25	1.192	25	91.9	20	1.336	40	101.3	20	4.34
<i>t</i> = 35°C		C ₆ H ₅ NO ₂ , Nitroben- zene (63)		30	118.5	25	1.213	45	119.1	22	4.20
19	39.22	15	2.697	35	148.9	(69)		50	137.8	24	4.08
20	41.33	20	2.474	40	182.3	20	1.48	55	155.1	26	3.96
25	52.46	25	2.250	45	214.2	22	1.27	60	170.7	28	3.85
30	64.62	(110)		48	238.3	24	1.21	65	185.5	30	3.75
35	77.13	<i>p</i> CO ₂ , atm.	<i>β'</i> *	50	250.6	26	1.17	68	194.5	32	3.66
40	90.9	<i>t</i> = 20°C		<i>t</i> = 35°C		28	1.13	<i>t</i> = 60°C		34	3.57
45	106.8	15	38.85	15	32.4	30	1.10	30	45.22	C ₈ H ₁₀ , <i>m</i> -Xylene (63)	
50	122.1	20	53.20	20	48.9	32	1.08	35	55.34	15	2.224
55	135.5	25	67.8	25	66.1	34	1.06	40	65.5	20	2.065
60	149.9	30	83.1	30	84.7	36 cf. (76)	1.04	45	75.9	25	1.915
65	166.4			35	104.6			50	86.0		
68	177.2			40	124.0			55	95.8		
* <i>β'</i> = cm ³ gas (S.T.P.) at <i>t</i> and <i>p</i> .		* <i>β'</i> = cm ³ gas (S.T.P.) at <i>t</i> and <i>p</i> .		* <i>β'</i> = cm ³ gas (S.T.P.) at <i>t</i> and <i>p</i> .		* <i>β'</i> = cm ³ gas (S.T.P.) at <i>t</i> and <i>p</i> .		* <i>β'</i> = cm ³ gas (S.T.P.) at <i>t</i> and <i>p</i> .		* <i>β'</i> = cm ³ gas (S.T.P.) at <i>t</i> and <i>p</i> .	

CO₂.—(Continued)
C₉H₁₂, Cumene (63)

<i>t</i> , °C	α
15	1.875
20	1.751
25	1.633

C₁₀H₁₂O₂, Eugenol (63)

<i>t</i> , °C	α
15	1.670
20	1.540
25	1.410

C₁₀H₁₄O, Carvol (63)

<i>t</i> , °C	α
15	2.762
20	2.506
25	2.289

C₁₀H₁₆, *d*-Limonene (63)

<i>t</i> , °C	α
15	1.924
20	1.790
25	1.651

C₁₆H₁₈N₂O₃, *p*-Azoxyphenetole (56)

For various organic solvents, *v.* (20.5, 42).

Russian petroleum (43); *cf.* (95)

<i>t</i> , °C	α
10	1.31
20	1.17

Transformer oil* (86)

<i>t</i> , °C	α
25	0.99
50	0.77
80	0.57

* See note to H₂, p. 262.

For general discussion, *v.* (14).

COCl₂, Phosgene

Atmospheric pressure; 20–21°C (7)

Solvent	<i>g</i> COCl ₂ <i>g</i> sol.
CCl ₄	0.28
CHCl ₃	0.59
C ₂ H ₄ O ₂ (glacial)	0.621
CH ₃ CO ₂ C ₂ H ₅	0.985
C ₆ H ₆	0.992
C ₇ H ₈	0.666
Paraffin oil.....	0.0
Russian mineral oil.....	0.359
Gasolene.....	0.81
"Chlorococane" (Chlorinated paraffin).....	0.310

C₂H₂Cl₄, 1, 1, 2, 2-Tetrachloroethane (3)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
16.8	149.7
25.1	89.4
29.9	74.9

C₆H₅Cl, Chlorobenzene (3)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
12.3	422.1
17	190.8
20	129.2
25	96.7
29.7	81.9

C₆H₅NO₂, Nitrobenzene (3)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
16.8	106.4

C₇H₈, Toluene (3)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
17	244.7
20	169.1
25	110.9
30	81.4
32	72.8

C₈H₁₀, Xylene (from tar) (37)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
12.3	457.3
15	309.0
20	136.9
25	96.1
29.8	71.24

C₁₀H₇Cl, α -Chloronaphthalene (3)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
17.0	104.5

Kerosene B. P., 180–280° (3)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
12.3	263.8
14	213.2
16	159.1
18	117.9
20	95.8
22	81.5
24	70.6
26	62.0
28	54.9
30	48.7

Heavy lubricating oil (3)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
15.6	79.7
23.5	39.3
31.0	24.5

Creosote (3)

<i>t</i> , °C	<i>g</i> COCl ₂ <i>100 g</i> sol.
16.2	77.42

COS

Toluene (125, 137); pyridine (47); nitrobenzene (47); alcohol (125).

CHF₃ (87)CH₃Br, Methyl bromide

Olive oil and sesame oil at 17 and 37°C (90).

CH₃Cl, Methyl chloride

Values of α (65)

<i>t</i> , °C	CCl ₄	(CHCl) ₂	CCl ₃ CHCl ₂	CH ₃ Cl
–5	117.5	243.8	171.2	281.9
0	87.6	174.8	125.2	208.6
+5	67.8	128.4	96.4	153.8
10	53.8	96.8	76.2	115.3
15	43.5	73.1	61.7	88.7
20	35.4	54.6	50.4	67.9

Ethyl alcohol and acetic acid (11); olive oil and sesame oil at 17 and 37°C (90).

CH₃PH₂

C₂H₅OH and (C₂H₅)₂O at 0° (54).

CH₄

Solvent: for general discussion <i>v.</i> (14)	<i>t</i> , °C	cm ³ per g solvent at 1 atm.	Lit.
H ₂ SO ₄ (95.6%); $\alpha = 0.03072$	20		(21)
CS ₂	20	0.36	(38)
CHCl ₃	20	0.32	(38)
CH ₃ O, Methyl alcohol.....	20	0.46	(38)
$\lambda = 0.5644 - 0.0046t - 0.044t^2$; range, 5 to 25°C; <i>v. also infra</i>			(72)
C ₂ H ₅ O, Ethyl alcohol; <i>cf.</i> (18, 20, 48); <i>v. also infra</i>	21	0.60	(38)
C ₃ H ₆ O, Acetone.....	20	0.61	(38)
$\lambda = 0.5906 - 0.00613t - 0.046t^2$; range, 5 to 25°C.....			(72)
C ₃ H ₇ O, Propyl alcohol; <i>v. infra</i>			
C ₄ H ₈ O ₂ , Ethyl acetate.....	20	0.45	(38)
C ₄ H ₁₀ O, Isobutyl alcohol; <i>v.</i> (141).....	20	0.91	(38)
C ₄ H ₁₀ O, Ether.....	0		(22)
$\alpha = 1.066$	10		(22)
$\alpha = 0.922$			
C ₅ H ₁₂ O, Amyl alcohol; <i>cf.</i> (40).....	20	0.44	(38)
C ₆ H ₅ NO ₂ , Nitrobenzene.....	20	0.16	(38)
C ₆ H ₆ , Benzene; <i>v. also infra</i>	23	0.51	(38)
C ₆ H ₇ N, Aniline.....	20	0.16	(38)
C ₆ H ₁₄ , Hexane.....	<i>v. infra</i>		
C ₇ H ₈ , Toluene.....			
C ₇ H ₁₆ , Heptane.....			
C ₈ H ₁₀ , Xylene; <i>v. infra</i>	23	0.53	(38)
C ₁₀ H ₁₆ , α -Pinene; <i>v. infra</i>			
Various organic solvents, <i>v.</i> (35)			
Petroleum ether; B. P. 65°.....	22	1.34	(38)
65–100°.....	20	0.84	(38)
100–150°.....	20	0.66	(38)
Paraffin oil.....	20	0.44	(38)
Kerosene.....	20	0.55	(38)
Russian petroleum; $\alpha = 0.144$	10		(43)
$\alpha = 0.131$	20		
Transformer oil ("Wemco" A*) { $\alpha = 0.381$	25		(86)
{ $\alpha = 0.164$	80		
Hydrocarbons from low-temp. (primary) tar.....	20	0.40	(38)
Phenols from low-temp. (primary) tar.....	20	0.27	(38)
Fraction from low-temp. (primary) tar.....	21	0.36	(38)
Heavy (machine) oil from brown coal.....	21	0.39	(38)
Creosote from brown coal.....	21	0.22	(38)
Phenol from bituminous coal.....	22	0.32	(38)

* See note to H₂, p. 262.

Values of α (83)

<i>t</i> , °C	CH ₃ OH (99%)	C ₂ H ₅ OH (99.8%)	C ₃ H ₇ OH, Isopropyl	C ₆ H ₆
21			0.4287	
22	0.4106	0.4288		0.4605
25	0.4032	0.4196	0.4193	0.4466
30	0.3891	0.4054	0.4078	0.4224
35	0.3711	0.3910	0.3956	0.3967
40	0.3436	0.3771	0.3837	0.3684
45	0.2962		0.3724	0.3387
50	0.2247		0.3630	0.3074
55			0.3549	
60			0.3482	

CH₄: Values of α (83).—(Continued)

$t, ^\circ\text{C}$	C ₆ H ₁₄ , <i>n</i> -Hexane	C ₇ H ₈ , Toluene	C ₇ H ₁₆ , <i>n</i> -Heptane	C ₈ H ₁₀ , <i>m</i> -Xylene	C ₁₀ H ₁₆ , <i>dl</i> - α -Pinene
20				0.4780	0.4565
21					
22	0.5597		0.6733		
25		0.4450			
30	0.5139	0.4300	0.6225	0.4540	0.4168
35		0.4171	0.5999		0.4011
40	0.4647	0.4081	0.5820	0.4337	0.3898
45		0.4034			0.3811
50	0.4373	0.4015		0.4203	
55.2					0.308
60	0.407	0.369		0.399	

C₂N₂, Cyanogen

Acetic acid and aniline (57, 76).

C₂H₂, Acetylene

Solvent (59)	B. P., $^\circ\text{C}$	P (average) mm Hg	$\beta, *; t =$ -10°C
Acetal.....		742	28.8
Acetaldehyde.....	20.8	744	60.2
Ethyl acetate.....	77.0	742	44.5
Ethyl formate.....	54.5	738	42.2
Isoamyl acetate.....	139.0	738.5	29.3
Isoamyl formate.....	123.0	739	17.5
Methyl acetate.....	57.5	736.5	52.3
Methylal.....	45.5	735	54.3
Methyl formate.....	32.3	740	48.4

Acetone, at -80°C (23); at 0 and 25°C (67); H₂SO₄, C₂H₅OH and acetone (134); paraffin oil (94); olive oil (138); various solvents (12, 25, 42).

Solvent (41)	p_{mm}	$^\circ\text{C}$	g C ₂ H ₂ /100 g solvent
Aniline.....	?	4.2	0.800
Benzene.....	755	4	0.744
Cyclohexane.....	535	3	0.3107
Dimethylaniline.....	751	0.3	0.737
Nitrobenzene.....	735	3.8	0.5537

* At the barometric pressure given.

C₂H₂F₂ and C₂H₃F, Chloroform, alcohol and acetone (127)**C₂H₃FO, Acetyl fluoride (87)****C₂H₄, Ethylene**

Solvent	t	α	Lit.
H ₂ SO ₄			(134)
CH ₃ OH.....	$\lambda = 3.3924 - 0.05083t +$ $0.00001t^2$; range, 5 to 25°C		(72)
C ₂ H ₅ OH.....			(18, 20, 134)
(CH ₃) ₂ CO.....	$\lambda = 4.0652 - 0.06949t +$ $0.000126t^2$; range, 5 to 25°C		(72)
	20.0	2.2900	(83)
	35.0	2.0460	
C ₆ H ₆	22.0	2.7865	(83)
	35.0	2.3530	
	50.0	2.1000	
C ₆ H ₁₄ , Hexane.....	22.0	2.8141	(83)
	35.0	2.5050	
	45.0	2.2190	
C ₇ H ₁₆ , Heptane.....	22.4	3.2071	(83)
	35.0	2.8245	
	39.0	2.7215	
Russian petroleum....	10	0.164	(43)
	20	0.142	

See also (10, 14, 18, 20, 48, 134).

C₂H₄O; olive oil and sesame oil at 17 and 37°C (90)**C₂H₅Cl; olive oil and sesame oil at 17 and 37°C (90)****C₂H₅F (91)****C₂H₆, Ethane**Values of α (83)

$t, ^\circ\text{C}$	CH ₃ OH (99%)	$t, ^\circ\text{C}$	C ₂ H ₅ OH (99.8%)	$t, ^\circ\text{C}$	C ₄ H ₈ O ₂ , Ethyl acetate
23	1.8587	22	2.1616	22	2.8521
30	1.6973	25	2.0981	25	2.8179
35	1.6124	30	1.9951	30	2.7575
40	1.5457	35	1.8968	35	2.6902
45	1.4874	40	1.8020	40	2.6178
		45	1.6958		
		50	1.5651		

$t, ^\circ\text{C}$	C ₆ H ₁₄ , Hexane	$t, ^\circ\text{C}$	C ₇ H ₁₆ , Heptane	$t, ^\circ\text{C}$	Amyl acetate
22.1	3.1035	25	4.1220	22.0	3.3085
30.0	2.8685	30	3.9820	30.0	3.0518
55.0	2.4008	35	3.8498	50.0	2.4433
		40	3.7182		

Amyl alcohol (40).

Ethyl alcohol (114).

C₂H₆O, Methyl ether; olive and sesame oil at 17 and 37°C (90)**C₃H₄, Allylene**

Vols. C₃H₄ dissolved by 1 vol. of (C₂H₅)₂O at 1 atm. = 100;
at 1°C ; = 30 at 16°C (70).

C₃H₅F (87)**C₃H₆ (10)****C₃H₇F (87)****C₃H₈; amyl alcohol (40); other solvents (71)****C₃H₉N, Trimethylamine (44)**

Solvent		α_{25}
Formula	Name	
CHCl ₃	Chloroform.....	548
CH ₃ NO ₂	Nitromethane.....	51.8
CH ₄ O	Methyl alcohol.....	651
C ₂ H ₃ N	Acetonitrile.....	58.4
C ₂ H ₆ O	Ethyl alcohol.....	431
C ₃ H ₆ O	Acetone.....	70.3
C ₃ H ₈ O	Propyl alcohol.....	432
C ₄ H ₈ O ₂	Ethyl acetate.....	77.4
C ₄ H ₁₀ O	Ethyl ether.....	48.8
C ₅ H ₁₂ O	Amyl alcohol.....	353
C ₆ H ₅ NO ₂	Nitrobenzene.....	48.6
C ₆ H ₆	Benzene.....	99.9
C ₆ H ₁₄	Hexane.....	68.7
C ₇ H ₇ NO ₂	<i>o</i> -Nitrotoluene.....	50.1
C ₇ H ₅ O	Benzyl alcohol.....	1198
C ₈ H ₈ O	Acetophenone.....	53.0
C ₉ H ₁₀ O ₂	Ethyl benzoate.....	69.8
C ₁₀ H ₇ Br	α -Bromonaphthalene.....	43.1

C₄H₈, Pseudobutylene; absolute ethyl alcohol: $\alpha_{19} = 47$ (121)**C₄H₈, Isobutylene; absolute ethyl alcohol: $\alpha_{19} = 42$ (121)****C₄H₁₀, Butane; C₂H₅OH (39); amyl alcohol (40); ethyl alcohol, ether and chloroform (71)****C₆H₁₅N, Triethylamine**

Solvent (44)		α_{25}
CH ₃ NO ₂ , Nitromethane.....		366
C ₆ H ₁₄ , Hexane.....		1979

For solubilities of various gases in cyclohexanol, *v. Cauquil*,
42, 24: 53; 27.

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THE SOLUBILITY OF GASES IN MOLTEN METALS AND ALLOYS

DAVID F. SMITH

Symbols and Abbreviations

v The volume of gas in cm^3 (reduced to S. T. P.) dissolved at the temperature t , by 10 g of solvent when the partial pressure of the gas is 760 mm.

p partial pressure of the gas in mm Hg.

M. P. Melting point.

Ag		
O ₂ (2)		
$t, ^\circ\text{C}$	$\sqrt{p/v}$	p , range
1020	1.35	751-753
1075	1.40	39-1203

Al		
H ₂ (3)		
$t, ^\circ\text{C}$		v
695		0.203
730		0.426
824		1.10
873		1.44
922		1.82

(1)		
N ₂ (3)		
670		0.187
690		1.19
760		1.245
850		1.66
930		2.01

Cu		
H ₂ (5)		
$t, ^\circ\text{C}$		v
(1084 M. P.)		0.600
1150		0.725
1250		0.910
1350		1.094
1450		1.278
1550		1.38

According to (7) $\sqrt{p/v} = 44.4$ from $p = 281$ to 1046 mm at 1123°C.

$d_4^t = \text{ca. } 8.9$		
N ₂ (3)		
1110		0.287
1168		.460
1255		.570
1320		.908

SO ₂ (6); cf. (8)		
$t, ^\circ\text{C}$		v
1100		14.5
1150		16.7
1200		18.9
1250		21.1
1300		23.3
1350		25.5

According to (7) $\sqrt{p/v} = \text{const.}$ from $p = 20$ to 1000 mm.

CO (3)		
1105		2.65
1173		2.36
1256		2.06

CO ₂ (3)		
1105		1.88
1179		1.86
1268		1.72

Fe		
H ₂ (5)		
(1530 M. P.)		2.72*
1550		2.79
1650		3.10
At 1550°, $\sqrt{p/v} = \text{const.}$		
* Given in the original as 2.66 at M. P. = 1510°.		

N₂ (4)
At 1530°, (Wt. % N₂)/ $\sqrt{p} = 0.021$ for p in atm., between 3 and 200 atm.

O₂ (9)
0.21 Wt. % O₂ at 1530°

Ni		
H ₂ (5)		
$t, ^\circ\text{C}$		v
(1450 M. P.)		3.87
1500		4.03
1600		4.33
At 1500° $\sqrt{p/v} = \text{const.}$		

Sn		
H ₂ (3)		
400		0.044
553		.058
704		.071
798		.094
900		.141
1005		.147
(1)		
800		0.042

Solubility of SO₂ in Liquid Cu Alloys (6)
 x_{Cu} = mole fraction of Cu in alloy

x_{Cu}	$t, ^\circ C$	v	x_{Cu}	$t, ^\circ C$	v
With Ag			With Cu_2S^*		
0.6292	1220	5.53	0.990	1270	17.95
With Au			0.975	1270	13.75
0.9654	1220	14.13	0.985	1270	13.78
0.8786	1220	6.23	0.992	1270	15.29
With Cu_2O			0.995	1270	17.49
0.9575	1220	3.46	With Pt		
0.9575	1330	5.81	0.8775	1330	4.44
0.9842	1170	12.87	$* \sqrt{p/v} = \text{const.}$		
0.955	1270	3.60			
0.970	1270	9.72			

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(For a key to the periodicals see end of volume)

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THE SOLUBILITY OF GASES IN SOLUTIONS

DAVID F. SMITH

INTRODUCTION

Arrangement.—The A-component is the dissolving gas. The B-component is the major and the C-component the minor constituent of the solution in which the gas is dissolved. Standard arrangement by A-components.

INTRODUCTION

Arrangement.—Le constituant A est le gaz dissout. Le constituant B et le constituant C sont respectivement le constituant le plus important et le constituant moins important de la solution dans laquelle le gaz est dissout. Arrangement type suivant les constituants A.

EINLEITUNG

Anordnung.—Die A-Komponente ist das gelöste Gas. Die B-Komponente ist der Hauptbestandteil, die C-Komponente der kleinste Bestandteil der Stoffe welche die Lösung zusammensetzen in welchen das Gas gelöst ist. Die Standard-Anordnung richtet sich nach der A-Komponente.

INTRODUZIONE

Convenzioni.—Il componente A è il gas disciolto. Nella soluzione in cui il gas è disciolto, B è il costituente in proporzione maggiore e C quello in proporzione minore. La disposizione è quella Standard per i componenti A.

Abbreviations.— α and λ , v. p. 254.

d the density (or sp. gr.) of the solution, before saturation with the gas except as otherwise noted.

M_C Moles of C per 1000 g B.

N_C Gram-equivalents of C per l of (B + C).

N'_C Moles of C per l of (B + C).

x_C Mole fraction of C in the solution, (B + C).

Abréviations.— α et λ , v. p. 254.

d La densité (ou le p. sp.) de la solution, avant saturation par le gaz, à moins d'une autre indication.

M_C Molécules de C pour 1000 g de B.

N_C Equivalent-grammes de C par litre de (B + C).

N'_C Molécules de C par litre de (B + C).

x_C Fraction moléculaire de C dans la solution (B + C).

Abkürzungen.— α und λ siehe S. 254.

d Dichte der Lösung vor der Gassättigung, ausser es ist etwas anderes angegeben.

M_C Mole C auf 1000 g B.

N_C Grammäquivalente von C pro l von (B + C).

N'_C Mole von C pro l von (B + C).

x_C Molenbruch von C in der Lösung (B + C).

Abbreviazioni.— α e λ , vedi pag. 254.

d Densità (o p. sp.) della soluzione, prima della saturazione col gas, salvo indicazioni contrarie.

M_C Grammi-molecole di C per 1000 g di B.

N_C Grammi-equivalenti di C per l di (B + C).

N'_C Grammi-molecole di C per l di (B + C).

x_C Frazione di grammi-molecole di C nella soluzione (B + C).

The data on solubilities in colloidal solutions (p. 281) are not as nearly complete as are the data on true solutions. Since these solubilities usually refer to a specifically prepared solute, typical examples only are presented.

Rn, Radon

Solution (94)	$t, ^\circ C$	α
10% by wt. damar gum in oil of turpentine.....	18.0	16.7
5% by wt. rosin in amyl alcohol.....	20.0	11.2
20% by wt. rosin in amyl alcohol.....	20.0	11.1

O_2 B = H_2O AQUEOUS SOLUTIONS OF ELECTROLYTES For pure H_2O , $10^3\alpha_{15} = 34.41$; $10^3\alpha_{25} = 28.22$							
C	N_C	$10^3\alpha_{15} (45)$			$10^3\alpha_{25} (45)$		
		0.5	1.0	2.0	0.5	1.0	2.0
HCl.....		32.6	31.0	28.3	27.1	26.3	24.5
$\frac{1}{2}H_2SO_4$		32.0	30.2		26.4	25.2	23.0

C	N_C	$10^3\alpha_{25} (45)$			$10^3\alpha_{25} (45)$		
		0.5	1.0	2.0	0.5	1.0	2.0
HNO_3		33.0	31.9	29.9	27.7	27.0	26.0
NaOH.....		27.3	21.9	14.4	22.9	18.7	12.2
NaCl.....		29.2	24.6	17.3	24.0	20.4	14.5
KOH.....		27.6	22.2		23.1	18.9	
$\frac{1}{2}K_2SO_4$		27.9	22.5		23.2	19.0	

C	N_C	3.0	4.0	5.0	3.0	4.0	5.0	Lit.
$\frac{1}{2}H_2SO_4$		24.3	22.1	20.2	21.0	19.1	17.8	(45)

C	N_C	$10^3\alpha_0$	$10^3\alpha_{10}$	$10^3\alpha_{20}$	$10^3\alpha_{30}$	Lit.
NaCl.....	0.0	48.72	37.93	30.91	26.12	(67)
NaBr.....	0.1	44.31	34.59	28.47	24.49	
NaI.....	1.0	29.85	23.42	19.75	17.84	
KCl.....	1.0	31.51	25.75	21.96	19.77	
KBr.....	1.0	31.08	24.98	21.20	18.67	
KI.....	1.0	30.94	21.11	19.88	18.18	
	1.0	31.87	25.31	21.26	18.96	

$O_2: B = H_2O$.—(Continued)
 $C = NaCl$; (for sea water *v. infra*)
 Values of $10^3\alpha_t$ (150)

N_C	0.0	1	2	3	5.431
$^{\circ}C$					
0	48.95	31.2	22.5	15.1	6.1
5	42.9	27.9	20.4	13.65	5.9
10	38.1	25.3	18.6	12.5	5.6
15	34.2	23.1	17.0	11.7	5.4
20	31.1	21.4	15.75	11.0	5.2
25	28.5	20.0	14.7	10.45	5.0
30	26.2	18.7	14.05	10.0	4.8

$C = KCN$ (98)

M_C	0.2	2.0	4.0	7.0	15.0
$10^3\alpha_{20}$	28.6	16.8	11.5	7.5	3.1

AQUEOUS SOLUTIONS OF ORGANIC COMPOUNDS
 $C = C_2H_6O$, Ethyl alcohol (91)

M_C^*	α_{20}	M_C^*	α_{20}	M_C^*	α_{20}
0.0	2.84	6.0	2.45	20.0	3.24
2.0	2.70	8.0	2.35	40.0	4.65
4.0	2.55	10.0	2.42	87.0	5.57

* Original results, which were given as volume % O_2 dissolved at $20^{\circ}C$ and 760 mm, were first corrected for the partial pressures of alcohol and water interpolated from data of Konovalov (79.5).

$C = C_2H_3Cl_3O_2$, Chloral hydrate (111)

M_C	1.8	3.0	5.0	6.3	8.5	14.0	25.5
d_{20}^{20}	1.113	1.173	1.244	1.280	1.334	1.426	1.521
$10^3\alpha_{15}$	29.6	26.1	23.8	23.4	24.1	27.0	32.7
M_C	1.2	2.8	6.8	9.5	15.1	21.4	
d_{20}^{20}	1.076	1.161	1.294	1.354	1.441	1.46	
$10^3\alpha_{20}$	28.03	25.01	23.26	24.11	27.31	32.77	

$C = C_3H_8O_3$, Glycerol (111)

M_C	2.8	3.6	6.5	8.9	11.8	27.2	83.6
$10^3\alpha_{15}$	27.43	25.28	20.17	17.44	15.69	9.53	8.86

$C = C_6H_{12}O_6$, Glucose (111)

M_C	0.7	1.5	3.0	6.0	8.0
$10^3\alpha_{20}$	26.76	22.25	17.82	13.88	12.45

$C = C_{12}H_{22}O_{11}$, Sucrose (111)

M_C	0.4	0.9	1.2	2.2	2.9
$10^3\alpha_{15}$	29.75	24.30	21.60	16.01	13.63

Air

$B = H_2O$; $C = H_2SO_4$

M_C	500.0	92.0	40.0	25.0	15.0	10.0	Lit.
$10^3\alpha_{18}$	16.2	10.0	6.44	5.26	5.55	7.20	(138)

Values of cm^3 of N_2 and O_2 at S.T.P. dissolved by 1 l of soln. in equilibrium with the normal dry atmosphere (11)

N_C	$t, ^{\circ}C$	N_2	O_2
0.0	20.9	15.6	31.0
4.9	20.9	9.1	19.5
8.9	20.9	7.2	15.5
10.7	21.2	6.6	14.3
20.3	21.1	4.9	11.9
24.8	21.5	4.8	10.3
29.6	20.8	5.1	11.7
34.3	20.9	10.0	20.1
35.8	21.1	12.9	27.5

O_2 AND N_2 IN SEA WATER (43)

In equilibrium with the dry atmosphere at 760 mm the number (S) of cm^3 of gas (S.T.P.) dissolved in 1 l of sea water is

$$S_{O_2} = 10.291 - 0.2809t + 0.006009t^2 + 0.0000632t^3 \\ - \pi_{Cl}(0.1161 - 0.003922t + 0.0000631t^2)$$

$$S_{N_2} = 18.639 - 0.4304t + 0.007453t^2 - 0.0000549t^3 \\ - \pi_{Cl}(0.2172 - 0.007187t + 0.0000952t^2)$$

where π_{Cl} is parts per 1000 of Cl in the sea water.

Range: t , 0 to 28° ; π_{Cl} , 0 to 20.

O_3

$B = H_2O$

$C = H_2SO_4$ (125)

N_C	0.0	0.100
$10^3\alpha_0$	494 (extrap.)	487

H_2

$B = H_2O$

AQUEOUS SALT SOLUTIONS

Values of $10^3\alpha_{15}$ for various salts; for pure H_2O , $10^3\alpha_{15} = 18.83$ (134)

N_C	1	2	3	4	5	6
C						
$\frac{1}{2}ZnSO_4$	14.46	11.13	8.52	6.67	5.10	
$\frac{1}{3}AlCl_3$	15.11	12.21	9.93	8.10	6.67	5.50
$\frac{1}{2}MgSO_4$	14.51	11.20	8.56	6.59	4.99	
$\frac{1}{2}CaCl_2$	14.93	11.95	9.58	7.80	6.35	5.10
LiCl	15.74	13.25	11.21	9.49		
NaCl*	14.78	11.44	8.80	6.99	5.73	
$\frac{1}{2}Na_2SO_4$	13.70	9.91	7.10			
NaNO ₃ *	14.96	12.01	9.84	8.08	6.67	5.42
$\frac{1}{2}Na_2CO_3$	13.40	6.99				
KCl*	15.02	12.17	9.96	8.20		
KNO ₃ *	15.24	12.76	10.76			
$\frac{1}{2}K_2CO_3$	13.38	9.67	7.00	5.08	3.72	2.73†

* See special tables below.

† 2.06 for $N_C = 7$; 1.58 for $N_C = 9$.

$C = NH_4NO_3$ (75)

M_C	d	$10^3\alpha_{20}$	M_C	d	$10^3\alpha_{20}$
0.0	0.9983	18.83	0.9	1.02602	17.55
0.2	1.00485	18.6	1.2	1.03445	17.05
0.5	1.01411	18.2	1.7	1.04846	16.25

$C = BaCl_2$

Values of $10^3\alpha$ (14)

$^{\circ}C$	5	10	15	20	25
M_C					
0.0	23.7	22.1	20.6	19.1	17.5
0.1	21.95	20.6	19.2	17.85	16.33
0.2	20.68	19.48	18.2	16.85	15.43
0.3	19.81	18.75	17.5	16.25	14.85
0.35	19.47	18.43	17.23	15.99	14.63

$C = NaCl$

Values of $10^3\alpha$ (14)

$^{\circ}C$	5	10	15	20	25	M_C	$15^{\circ}C$
M_C							
0.2	22.0	20.65	19.3	17.78	16.3	3.0	9.21
0.4	20.8	19.7	18.4	17.0	15.5	5.0	6.29
0.6	19.96	18.96	17.75	16.4	14.9		
0.8	19.3	18.34	17.2	15.9	14.4		
1.1	18.37	17.48	16.38	15.29	13.8		

C = NaNO₃
Values of 10³α

<i>t</i> = 15°C (48)		<i>t</i> = 20°C (75)		
<i>N_C</i>	10 ³ α	<i>N_C</i>	<i>d</i>	10 ³ α
0.7	15.96	0.1	1.0039	18.5
1.5	13.45	0.2	1.0094	18.0
2.5	10.87	0.3	1.0150	17.6
4.0	8.0	0.5	1.0259	16.7
5.7	5.59	0.9	1.0469	15.1
		1.75	1.0873	13.0

C = KCl (75)

<i>M_C</i>	<i>d</i>	10 ³ α ₂₀	<i>M_C</i>	<i>d</i>	10 ³ α ₂₀
0.1	1.0030	18.43	0.9	1.0388	15.35
0.3	1.01222	17.6	1.2	1.0516	14.41
0.6	1.0257	16.45	2.1	1.0867	12.59

C = KNO₃ (75)

<i>M_C</i>	<i>d</i>	10 ³ α ₂₀	<i>M_C</i>	<i>d</i>	10 ³ α ₂₀
0.1	1.0043	18.6	0.9	1.0516	16.5
0.3	1.0169	18.1	1.2	1.0676	15.5
0.5	1.0287	17.6	1.6	1.0896	14.2
0.7	1.0404	17.1			

AQUEOUS SOLUTIONS OF ACIDS AND BASES

C = H₂SO₄ (19)

<i>M_C</i>	0.0	5.69	16.37	221.5
10 ³ α ₂₀	19.4	8.89	6.60	10.2

Values of 10³α₂₅ (10³α₂₅ for pure H₂O = 17.65) (45)

<i>N_C</i>		0.5	1.0	2.0	3.0	4.0
<i>C</i>						
HCl.....		17.0	16.4	15.4	14.6	
½ H ₂ SO ₄		16.9	16.2	14.9	13.7	12.9
HNO ₃		17.2	16.8	15.9	15.3	14.7
CH ₃ COOH.....		17.6	17.5	17.2	17.0	17.0
CH ₂ ClCOOH.....		17.3	17.0	16.5		
NaOH.....		15.1	12.7	8.9	6.6	5.0
KOH.....		15.3	13.0			

AQUEOUS SOLUTIONS OF ORGANIC COMPOUNDS

C = C₂H₆O, Ethyl alcohol (91)

<i>M_C</i>	0.0	2.0	4.0	6.0	8.5	11.0	22.0	44.0
α ₂₀	1.84	1.38	1.225	1.14	1.01	1.14	1.97	2.51

C = C₃H₈O₃, Glycerol

<i>M_C</i>	1.9	3.2	6.6	10.0	23.0	106.0	Lit.
10 ³ α ₁₅	16.5	15.1	12.2	10.5	8.1	8.7	(111)

<i>M_C</i>	10 ³ α ₁₄	10 ³ α ₂₁	<i>M_C</i>	10 ³ α ₁₄	10 ³ α ₂₁
0.0	19.28	18.38	1.4	18.00	17.08
0.2	19.03	18.17	1.6	17.86	16.90
0.4	18.80	17.97	1.8	17.74	16.72
0.6	18.60	17.78	2.0	17.63	16.5
0.8	18.43	17.60	2.2		16.3
1.0	18.28	17.43	2.4		16.1
1.2	18.14	17.26	Lit.	(57)	

<i>M_C</i>	10 ³ α ₂₅	<i>M_C</i>	10 ³ α ₂₅	<i>M_C</i>	10 ³ α ₂₅
0.0	17.98	7.0	10.7	95.0	3.7
0.5	17.12	10.0	9.2	205.0	3.2
1.5	15.7	20.0	6.6	Lit.	(28)
3.0	13.9	40.0	4.9		

C = C₂H₃Cl₃O₂, Chloral hydrate (111)

<i>M_C</i>	0.6	3.5	6.0	9.5	14.5	23.0
<i>d</i> ₁₅ ¹⁵	1.040	1.193	1.276	1.356	1.433	1.504
10 ³ α ₁₅	17.7	14.8	13.2	12.3	12.8	13.2

<i>M_C</i>	1.0	2.5	5.0	7.0	10.0	13.0	22.0
<i>d</i> ₂₀ ²⁰	1.066	1.145	1.243	1.300	1.368	1.411	1.500
10 ³ α ₂₀	17.2	15.5	13.6	12.8	12.4	12.7	13.8

Values of 10³α for *N_C* = 1 mole/l (64)

<i>C</i>	Urea	Acetamide	Alanine	Glycocoll
°C.....	20.17	20.11	20.08	20.16
10 ³ α.....	17.0	18.0	15.6	15.8

C = C₃H₆O₂, Propionic acid

Values of 10³α_{*t*} (14)

<i>M_C</i>	°C	5	10	15	20	25
0.4		22.3	21.3	20.6	18.8	17.2
0.8		21.9	21.1	19.6	18.4	17.0
1.2		21.6	20.7	19.2	18.05	16.5
1.5		21.3	20.3	18.9	17.8	16.0

C = C₆H₁₂O₆, Glucose (111)

<i>M_C</i>	0.8	1.5	2.5	4.5	8.0
10 ³ α ₂₀	15.90	14.42	12.76	10.34	7.79
<i>N_C</i> , mole/l.....	0.0	0.230	0.485	0.966	Lit.
°C.....	20.11	20.00	20.25	20.28	(64)
10 ³ α.....	18.1	17.6	16.6	15.2	

C = C₁₂H₂₂O₁₁, Sucrose (111)

<i>M_C</i>	0.2	0.5	0.7	1.3	1.9	2.2
10 ³ α ₁₆	16.9	15.5	14.7	12.2	10.4	9.4
<i>M_C</i>	1	2	Lit.			
10 ³ α ₁₆	12.80	7.31	(134)			

Cl₂

B = H₂O

C = HCl (104); cf. (112)

<i>N_C</i>	0.0	0.1	0.3	1.0	3.0	4.0	6.0	9.0
α ₂₁	2.117	1.48	1.405	1.61	2.16	2.415	2.904	3.65

C = C₂H₄O₂, Glacial acetic acid (71)

Vol. % <i>C</i>	99.84	90.00	75.00	65.00
°C.....	16	15	15	15
α _{<i>t</i>}	34.7	24.0	15.57	12.73

C = NaCl (82)

α = 2.23 - 0.05505*t* + 0.000025*t*² for 9.97 Wt. % NaCl; and

α = 2.19 - 0.1128*t* + 0.00328*t*² - 0.0000422*t*³ for 16.01 Wt. % NaCl; and

α = 1.74 - 0.0672*t* + 0.00117*t*² - 0.0000097*t*³ for 19.66 Wt. % NaCl; range, 0 to 25°C.

26.39 Wt. % NaCl; *d* = 1.205 at 15°C (78)

<i>t</i> , °C.....	85	70	60	30	15	Lit.
α _{<i>t</i>} *.....	0.048	0.099	0.133	0.28	0.38	(112)

* Contrary to the statement of Kumpf (82) the authors observed no precipitation of NaCl from concentrated solutions upon passing chlorine through them. They found, however, an increase in solubility after long continued passage of Cl₂ through the solution which they attributed to the formation of oxygenated chlorine compounds.

HCl

B = H₂O

C = H₂SO₄ (23)

<i>x_B</i>	α ₂₅	<i>x_B</i>	α ₂₅
0.0	4.505	0.35	1.028
0.07	2.208	0.40	1.022
0.15	1.486	0.50	1.23
0.20	1.27	0.55	1.56
0.30	1.06	0.63	3.96

HCl: B = H₂O.—(Continued)C = C₂H₅OH, Ethyl alcohol (72)

The following equation reproduces the results within the experimental error which is about 2.5% for $p > 2.50$ mm. The percentage error for $p < 2.50$ mm is usually considerably greater than this.

$$\log_{10} p_A = a \log_{10} N_A + b N_A + d N_A^2 + f$$

 p_A = partial pressure of HCl in mm Hg N_A = moles HCl per liter of solution

$$a = 1.3171 + 1.0306 N_B + 0.3907 N_B^2$$

$$100b = 3.847 - 12.11 N_B - 3.851 N_B^2$$

$$100d = 1.2633 + 0.398 N_B + 0.10798 N_B^2$$

$$f = -0.2437 - 0.2175 N_B - 0.1107 N_B^2$$

 N_B = moles H₂O per liter of solutionRange, $N_A = 0.3$ to 3.0 and $N_B = 0$ to 2.5 .**SO₂**B = H₂O

AQUEOUS SOLUTIONS OF ACIDS

C = H₂SO₄ (106)

N_C	α_{20}	N_C	α_{20}	N_C	α_{20}
16.0	26.1	26.0	20.3	34.0	19.8
18.0	25.8	28.0	19.0	35.0	21.2
20.0	25.1	30.0	18.0	35.5	23.0
22.0	23.7	31.3	17.5	36.0	24.5
24.0	22.0	32.0	17.9	37.0	26.1

C = H₂SO₄; $d_4^{20} = 1.836$; $N_C = 36.3$ at 20°C (29)

$t, ^\circ\text{C}$	d_4^t	α_t	$t, ^\circ\text{C}$	d_4^t	α_t
0		53.0	50	1.8186	9.5
10	1.8232	35.0	60	1.8165	7.0
20	1.8225	25.0	70	1.8140	5.5
25	1.8221	21.0	80	1.8112	4.5
30	1.8216	18.0	90	1.8080	4.0
40	1.8205	13.0			

* d of satd. soln.

AQUEOUS SALT SOLUTIONS

Values of α_{25} (41)

C	N_C	0.5	1.0	1.5	2.0	2.5	3.0
NH ₄ NO ₃		31.11	32.13	33.24	34.14	34.82	35.86
NH ₄ Cl.....		31.68	33.32	34.87	36.43	37.90	39.19
NH ₄ Br.....		33.21	36.15	39.19	42.20	45.05	47.87
(NH ₄) ₂ SO ₄		30.55	30.98	31.45	32.02	32.50	32.94
NH ₄ CNS.....		34.61	39.16	43.30	47.88	52.23	56.31
CdCl ₂		29.00	27.99	26.99	25.80	24.82	23.87
CdBr ₂		29.23	28.41	27.64	26.82	25.79	25.16
CdI ₂		30.48	30.93	31.30	31.83	32.05	32.77
CdSO ₄		28.50	27.22	25.87	24.35	23.03	21.77
NaCl.....		29.74	29.55	29.28	29.10	28.87	28.73
NaBr.....		30.93	31.64	32.31	33.22	33.75	34.58
Na ₂ SO ₄		29.28	28.53	27.90	27.04	26.26	26.06
NaCNS.....		32.47	35.03	37.36	39.73	42.01	44.29
KCl.....		31.53	33.03	34.59	36.02	37.53	38.73
KBr.....		32.93	35.83	38.85	41.49	44.71	47.88
KI.....		35.42	41.01	46.34	51.99	57.38	62.63
K ₂ SO ₄		30.42	30.79				
KNO ₃		30.97	31.87	32.77	33.59	34.42	35.29
KCNS.....		34.42	38.83	43.08	47.47	51.18	56.12

Values of α_{35} (41)

C	N_C	0.5	1.0	1.5	2.0	2.5	3.0
NH ₄ NO ₃		20.70	21.48	21.96	22.67	23.63	24.31
(NH ₄) ₂ SO ₄		20.31	20.51	20.82	21.21	21.48	21.81
CdCl ₂		19.26	18.82	18.22	17.75	17.05	16.56
CdBr ₂		19.39	19.02	18.45	18.26	17.46	16.99

C	N_C	0.5	1.0	1.5	2.0	2.5	3.0
CdI ₂		20.17	20.44	20.71	21.02	21.26	21.54
CdSO ₄		19.01	18.11	17.21	16.23	15.43	14.40
Na ₂ SO ₄ *.....		19.39	18.92	18.45	17.91	17.51	17.08
KCl*.....		21.04	22.29	23.53	24.77	25.64	26.61
KBr.....		22.01	24.37	26.27	28.30	30.24	32.03
KI.....		23.31	26.81	30.70	33.72	37.11	40.27
KNO ₃		20.63	21.30	21.97	22.80	23.53	24.23
KCNS.....		22.72	25.52	28.39	31.07	33.80	38.06

* See special tables below.

C = Na₂SO₄Values of moles SO₂ per 1000 g H₂O* (62)

M_C	$^\circ\text{C}$	20	30	40	50	M_C	$^\circ\text{C}$	20	30	40	50
0.0		1.661	1.188	0.872	0.644	0.5		1.626	1.208	0.925	
0.1		1.664	1.199	0.895	0.680	0.6		1.605	1.201	0.924	
0.2		1.663	1.209	0.910	0.709	0.7		1.583	1.192	0.921	0.742
0.3		1.657	1.214	0.919	0.725	1.0		1.519		0.907	0.738
0.4		1.644	1.213	0.924	0.733	1.1		1.499		0.901	0.736
						1.4		1.433	1.096	0.880	0.726

* The partial pressure of SO₂ was in all except three cases within 10 mm of 760 mm. Thus the values given above are in general subject to an error of about 1%. It will be noted that the values here given for pure water are somewhat different from those determined by the author in connection with his measurements on KCl solutions.

C = KCl (62)

$M_A = M_{0A} + 10^{-3}aM_C$, for $p_A = 760$ mm Hg; M_A (resp. M_{0A}) = solubility of SO₂ in moles per 1000 g H₂O in the solution (resp. in pure water). M_C = moles of KCl per 1000 g H₂O; range, $M_C = 0$ to 5 .

$^\circ\text{C}$	M_{0A}	a	$^\circ\text{C}$	M_{0A}	a
10	2.374	387.3	50	0.6528	57.0
15	1.976	294.9	60	0.5099	34.99
20	1.650	227.9	70	0.4082	23.96
30	1.179	141.7	80	0.3343	15.06
40	0.8674	88.03	90	0.2799	10.93

H₂SB = H₂O

C = HCl (74)

N_C	α_{25}	N_C	α_{25}	N_C	α_{25}	N_C	α_{25}
0.0	2.266	0.6	2.250	2.0	2.272	3.5	2.308
0.1	2.256	1.0	2.256	2.5	2.280	4.5	2.384
0.3	2.247	1.5	2.264	3.0	2.290	4.8	2.422

C = HI

Total pressure = 760 mm; $t = 25^\circ\text{C}$ (116)

N_C	0.0	1.0	2.0	3.0	4.0	5.0	6.0	9.0
N_A	0.100	0.111	0.124	0.140	0.155	0.169	0.187	0.26

C = Various electrolytes (97)

C	N_C	α_{25}	C	N_C	α_{25}
Nil.....		2.292	NaCl.....	1.0	1.941
HCl.....	0.5	2.235	NaCl.....	0.5	2.132
H ₂ SO ₄	0.5	2.074	NaBr.....	1.0	2.143
NH ₄ NO ₃	1.0	2.269	Na ₂ SO ₄	0.5	1.673
NH ₄ Cl.....	1.0	2.200	Na ₂ SO ₄	0.25	1.960
NH ₄ Br.....	1.0	2.292	NaNO ₃	1.0	2.047
(NH ₄) ₂ SO ₄	0.5	1.879	KCl.....	1.0	1.955
(NH ₄) ₂ SO ₄	0.25	2.086	KBr.....	1.0	2.166
CO(NH ₂) ₂	1.0	2.338	KI.....	1.0	2.246
NH ₄ C ₂ H ₃ O ₂	1.0	2.498	K ₂ SO ₄	0.5	1.788
C ₄ H ₆ O ₆ , Tartaric acid.	1.0	2.164	K ₂ SO ₄	0.25	2.040
C ₄ H ₆ O ₆ , Tartaric acid.	3.0	1.967	KNO ₃	1.0	2.093

C = NaCl (67)

N_C	α_0	α_{10}	α_{20}	α_{30}
0.1	4.230	3.062	2.330	1.853
1.0	3.296	2.552	2.070	1.738
3.0	2.383	1.753	1.354	1.138

C = NaHS (46)

N'_C	α_{15}	α_{25}	α_{35}	α_{45}
0.05			1.84	1.43
0.10	2.96	2.33	1.84	
0.20	2.89	2.32		

 N_2 B = H_2O

AQUEOUS SOLUTIONS OF ACIDS

C = H_2SO_4 (11)

N_C	0.0	5.0	10.0	20.0	25.0	34.0	36.0
$10^3\alpha_{21}$	15.6	9.2	6.5	4.7	5.0	9.7	13.4

C = $C_3H_6O_2$, Propionic acidValues of $10^3\alpha_t$ (14)

M_C	$^{\circ}C$	5	10	15	20	25
0.6		21.0	19.1	16.8	15.3	13.7
1.0		20.8	18.6	16.5	14.8	13.5
1.4		20.3	18.2	16.2	14.7	13.2
1.7		19.6	17.8	16.0	14.6	13.1

C = $C_4H_8O_2$, Isobutyric acid

For $M_C = 6.81$, $\alpha_{23.02} = 0.0364$; $\alpha_{29.02} = 0.0346$ between 231 and 720 mm Hg (28).

AQUEOUS SALT SOLUTIONS

C = $BaCl_2$ Values of $10^3\alpha_t$ (14)

M_C	0.18	0.36	0.65	0.77
5	18.1	16.0	13.5	12.8
10	16.7	14.66	12.5	11.74
15	14.9	13.2	11.3	10.6
20	13.35	11.78	9.80	9.20
25	11.6	10.3	8.5	7.9

C = NaCl; for sea water, v. p. 272

Values of $10^3\alpha_t$ (14)

$^{\circ}C$	M_C	0.1	0.4	0.8	1.2	1.6	2.3
5		21.4	17.7	15.5	13.7	12.3	10.3
10		18.65	16.2	14.2	12.47	11.05	9.26
15		16.5	14.54	12.7	11.2	9.85	8.02
20		14.9	12.9	11.1	9.7	8.45	6.6
25		13.1	11.1	9.4	8.0	6.9	5.2

AQUEOUS SOLUTIONS OF ORGANIC COMPOUNDS

C (64)	N'_C	$^{\circ}C$	$10^3\alpha_t$
Glucose.....	1.0	20.18	12.15
Glucose.....	0.5	20.21	13.80
Glucose.....	0.25	20.2	14.80
Alanine.....	1.0	20.19	12.13
Glycocoll.....	1.0	20.16	12.12
Arabinose.....	1.0	20.21	12.03
Levulose.....	1.0	20.25	12.21
Erythritol.....	1.0	20.25	13.21
Urea.....	1.0	20.18	14.77
Acetamide.....	1.0	20.22	14.75

C = C_2H_6O , Ethyl alcohol

Vol. % C.....	0.0	20.0	50.0	100.0	Lit.
$10^3\alpha_{26}$	14.97	14.07	13.58	13.12	(73)

C = $C_2H_3Cl_3O_2$, Chloral hydrate

M_C	$10^3\alpha_{25}$	M_C	$10^3\alpha_{15}$	M_C	d_{20}^{20}	$10^3\alpha_{15}$
0.0	16.45	0.0	17.02	1.0	1.067	16.0
1.0	14.77	0.5	16.20	2.5	1.148	14.1
2.0	13.41	1.0	15.38	3.5	1.191	13.3
4.0	11.71	2.0	13.86	5.0	1.243	12.5
6.0	11.04	4.0	12.12	8.0	1.327	12.6
10.0	11.06	6.0	11.52	15.0	1.440	14.1
15.0	12.75	9.0	11.46	22.5	1.504	15.0
23.0	15.15	14.0	12.78	Lit	(111)	
Lit.	(53)	24.0	15.83			
		Lit.	(53)			

C = $C_3H_8O_3$, Glycerol

M_C	$10^3\alpha_{15}$	M_C	$10^3\alpha_{25}$	M_C	$10^3\alpha_{15}^*$	M_C	$10^3\alpha_{25}^*$
3.6	12.68	0.0	14.3	0.0	17.1	25.0	5.8
8.0	9.60	2.0	9.5	1.0	15.4	45.0	5.1
12.0	7.43	4.5	6.4	3.0	12.9	60.0	5.0
15.0	7.03	10.0	4.5	4.0	11.8	95.0	5.0
45.0	7.3	30.0	2.7	7.0	9.5	205.0	5.0
95.0	7.8	60.0	2.0	10.0	8.2	∞	5.0
205.0	9.1	Lit.	(28)	15.0	6.9	(pure glyc.)	
Lit.	(111)						

* Argon-free N_2 (53).

C = $C_{12}H_{22}O_{11}$, Sucrose

M_C	0.4	0.8	1.2	2.7	Lit.
$10^3\alpha_{15}$	14.7	12.5	10.9	7.5	(111)

B = CH_3O , Methyl alcohol

C = KI (84)

M_C	d_4^5	$10^3\alpha_5$	d_4^{15}	$10^3\alpha_{15}$	d_4^{25}	$10^3\alpha_{25}$
0.0	0.8080	212	0.7980	184	0.7937	151
0.1324	0.8171	199	0.8070	173	0.8019	140
0.1897	0.8249	193	0.8150	168	0.8101	134
0.7398	0.8930	165	0.8841	140	0.8801	115

C = CH_4N_2O , Urea (84)

M_C	d_4^5	$10^3\alpha_5$	d_4^{15}	$10^3\alpha_{15}$	d_4^{25}	$10^3\alpha_{25}$
0.0	0.8080	212	0.7980	184	0.7937	151
0.4688	0.8148	199	0.8050	175	0.7997	143
0.847	0.8231	192	0.8122	168	0.8080	137
1.326	0.8350	184	0.8241	162	0.8193	132

 NH_3 B = H_2O

According to Konovalov (80) the solubility of NH_3 in aqueous solutions of C = $AgNO_3$, $Cd(NO_3)_2$, $Zn(NO_3)_2$, $NiCl_2$, $Cu(NO_3)_2$, $CuCl_2$, $CuSO_4$ or $Cu(C_2H_3O_2)_2$ is given by

$$p_{NH_3} = k(N_{NH_3} - 2N_C)$$

For p in mm Hg, $k = 56.58$ for C = $AgNO_3$.

C = Various salts

Values of moles NH_3 per l of saturated solution for $N_C = 1$, at $t = 60^{\circ}C$ and $p_A = 61.1$ mm (80.5).

C		C	
$\frac{1}{2}CaCl_2$	1.171	$HCOONa$	0.905
$\frac{1}{2}SrCl_2$	1.071	CH_3COONa	0.879
$\frac{1}{2}BaCl_2$	0.998	KOH	0.787
$\frac{1}{2}(HCOO)_2Ba$	0.856	KCl	0.917
$\frac{1}{2}(CH_3COO)_2Ba$	0.777	$\frac{1}{2}K_2CO_3$	0.807
$NaOH$	0.826	CH_3COOK	0.836
$NaCl$	0.963	$\frac{1}{2}(COOK)_2$	0.842
$\frac{1}{2}Na_2CO_3$	0.841		

C = NH_4NO_3

Up to $N_A = 0.8$, p_A/N_A at $25^{\circ}C$ is the same as in pure water, for $N_C = 0.15$ (146).

NH₃: B = H₂O.—(Continued)

Values of moles NH₃ per l of saturated solution, at 25°C; $p_A = 13.45$ mm Hg (1, 121)

N_C	0.5	1.0	1.5
C			
LiOH.....	0.863	0.808	0.768
LiCl.....	0.980	1.008	1.045
LiBr.....	1.001	1.040	1.090
LiI.....	1.030	1.094	1.190
NaOH.....	0.876	0.789	0.716
NaCl.....	0.938	0.889	0.843
NaBr.....	0.965	0.916	0.890
NaI.....	0.995	0.992	0.985
Na ₂ S.....	0.887	0.795	0.726
KOH.....	0.852	0.716	0.607
KF.....	0.839	0.722	0.626
KCl.....	0.930	0.866	0.809
KClO ₃	0.927*		
KBr.....	0.950	0.904	0.857
KBrO ₃	0.940*		
KI.....	0.970	0.942	0.900
KIO ₃	0.951*		
K ₂ SO ₄	0.875	0.772	0.678
KNO ₂	0.920	0.855	0.798
KNO ₃	0.923	0.862	0.804
K ₂ HPO ₄	0.860	0.749	0.664
K ₂ CO ₃	0.778	0.650	0.554
K ₂ C ₂ O ₄	0.866	0.771	0.675
HCOOK.....	0.868	0.760	0.678
CH ₃ COOK.....	0.866	0.765	0.685
KCN.....	0.926	0.858	0.802
KCNS.....	0.932	0.868	0.814
K ₂ CrO ₄	0.866	0.771	0.675
KBO ₂	0.814	0.677	0.560

* $N_C = 0.25$.

$t = 35^\circ\text{C}$, $p = 22.1$ mm, $N_C = 0.5$

C		C	
NaOH.....	0.896	KCl.....	0.923
NaCl.....	0.966	$\frac{1}{2}$ K ₂ CO ₃	0.914*
$\frac{1}{2}$ Na ₂ CO ₃	0.932*	$\frac{1}{2}$ (COOK) ₂	0.902
KOH.....	0.870	CH ₃ COOK.....	0.902

* $N_C = 0.426$.

C = C₆H₆O, Phenol
 $t = 25^\circ\text{C}$ (15)

N'_A	N'_C	p_A (mm)	N'_A	N'_C	p_A (mm)
1.008	0.000	13.56	0.900	1.33	6.49
0.988	0.245	11.47	0.493	0.260	4.99
0.969	0.492	9.91	0.480	0.516	4.08
0.929	0.980	7.90	0.246	0.260	2.08
0.925	1.03	7.76	0.917	1.024	5.01*
0.917	1.024	7.35			

* $t = 18^\circ\text{C}$.

NO
B = H₂O
C = H₂SO₄ (138)

M_C	10.0	15.0	25.0	40.0	91.8
d_{15}^{15}	1.394	1.498	1.6275	1.729	1.820
$10^3\alpha_{18}$	11.2	11.0	10.6	10.95	18.1

N₂OB = H₂O

AQUEOUS SOLUTIONS OF ACIDS

Values of $10^3\alpha_{25}$ (102)

C	M_C	d_4^{25}	$10^3\alpha_{25}$	C	M_C	d_4^{25}	$10^3\alpha_{25}$
HNO ₃	1.139	1.0351	541	HIO ₄	2.616	1.4066	238
HNO ₃	2.428	1.0731	551	H ₂ SO ₄ ...	1.181	1.0680	442
HNO ₃	4.091	1.1191	562	H ₂ SO ₄ ...	3.079	1.1630	387
HCl.....	1.105	1.0168	512	H ₂ SO ₄ ...	5.684	1.2687	382
HCl.....	2.217	1.0335	501	H ₂ SO ₄ ...	8.02	1.3363	399
HCl.....	5.049	1.0741	499	H ₃ PO ₄ ...	1.239	1.0593	464
HCl.....	7.49	1.1050	521	H ₃ PO ₄ ...	2.088	1.0964	438
HIO ₄	1.097	1.1740	387	H ₃ PO ₄ ...	6.640	1.2557	353

C = HCl (45)

N_C	0.500	1.000	2.000
$10^3\alpha_{15}$	716	700	679
$10^3\alpha_{25}$	529	520	510

C = H₂SO₄ (45)

N_C	0.500	1.000	2.000	3.000	4.000
$10^3\alpha_{15}$	696	663	611	571	533
$10^3\alpha_{25}$	519	497	466	442	424

C = HNO₃ (45)

N_C	0.580	1.000	2.001
$10^3\alpha_{15}$	737	737	735
$10^3\alpha_{25}$	547	552	560

C = H₃PO₄
Values of $10^3\alpha_t$ (124)

M_C	0.357	0.505	0.989	1.119	1.571
°C					
5	1057	1036	988	964	917
10	883	866	830	810	771
15	739	726	698	683	650
20	625	615	593	581	556
25	543	533	514	505	486

C = C₂H₂O₄, Oxalic acid
Values of $10^3\alpha_t$ (124)

°C	5	10	15	20	25
$M_C = 0.0909$	1145	953	794	669	578
$M_C = 0.427$	1109	926	774	654	564

C = C₃H₆O₂, Propionic acid (75)

N_C	0.2046	0.816	2.139	2.385	4.646
$10^3\alpha_{20}$	632	637	650	653	722

AQUEOUS SOLUTIONS OF BASES
C = NaOH (143)

N_C	0.0	1.018	2.544	5.088	10.18
$10^3\alpha_0$	1140	823	434.5	185.0	115.7
$10^3\alpha_{10}$	868	600	302.9	103.8	62.8
$10^3\alpha_{20}$	641	438.0	253.3	78.2	78.2

C = KOH (143)

N_C	0.0	0.713	1.782	3.565	7.130
$10^3\alpha_0$	1140	921	666	348.5	157.2
$10^3\alpha_{10}$	868	694	531	274.7	120.1
$10^3\alpha_{20}$	641	538	419	251.6	251.6

AQUEOUS SALT SOLUTIONS
 Values of $10^3\alpha_{25}$ (102)

C	M _C	d_4^{25}	$10^3\alpha_{25}$
NH ₄ NO ₃	0.933	1.0249	498
NH ₄ NO ₃	2.045	1.0527	464
NH ₄ NO ₃	4.463	1.1040	409
NH ₄ NO ₃	11.95	1.2116	308
NH ₄ Cl.....	1.118	1.0146	466
NH ₄ Cl.....	2.470	1.0312	411
NH ₄ Cl.....	5.185	1.0594	347
NH ₄ Br.....	1.093	1.0535	474
NH ₄ Br.....	2.341	1.1088	423
NH ₄ Br.....	5.161	1.2122	358
(NH ₄) ₂ SO ₄	1.476	1.0896	271
(NH ₄) ₂ SO ₄	2.561	1.1393	175
ZnSO ₄	0.963	1.1403	299
ZnSO ₄	1.891	1.2699	169
Zn(NO ₃) ₂	0.872	1.1223	397
Zn(NO ₃) ₂	1.816	1.2433	291
Cd(NO ₃) ₂	0.8145	1.1435	350
Cd(NO ₃) ₂	1.701	1.2874	270
Cu(NO ₃) ₂	0.709	1.1028	356
Cu(NO ₃) ₂	1.459	1.2049	278
MnSO ₄	0.9585	1.1226	306
MnSO ₄	2.022	1.2460	170
FeSO ₄	0.726	1.1017	340
FeSO ₄	1.463	1.2011	216
Fe ₂ (SO ₄) ₃	0.687	1.2240	259
Fe ₂ (SO ₄) ₃	1.460	1.4319	131
CoSO ₄	0.795	1.1131	275
CoSO ₄	1.612	1.2218	171
NiSO ₄	0.946	1.1355	246
NiSO ₄	1.924	1.2642	138
Cr ₂ (SO ₄) ₃	0.605	1.1657	318
Cr ₂ (SO ₄) ₃	1.294	1.3280	182
Al ₂ (SO ₄) ₃	0.528	1.1558	224
Al ₂ (SO ₄) ₃	0.849	1.2381	134
Al(NO ₃) ₃	0.495	1.0703	361
Al(NO ₃) ₃	1.0235	1.1414	293
MgSO ₄	0.908	1.0992	295
MgSO ₄	1.820	1.1925	159
Mg(NO ₃) ₂	1.0215	1.0935	392
Mg(NO ₃) ₂	2.1485	1.1846	285
CaCl ₂	0.9535	1.0786	339
CaCl ₂	2.104	1.1665	202
Ca(NO ₃) ₂	1.474	1.1503	322
Ca(NO ₃) ₂	3.232	1.2927	194
BaCl ₂	0.633	1.1090	374
BaCl ₂	1.374	1.2290	261
NaCl.....	1.178	1.0438	390
NaCl.....	2.426	1.0874	285
NaCl.....	4.761	1.1600	172
NaBr.....	1.161	1.0849	401
NaBr.....	2.306	1.1645	309
NaBr.....	5.098	1.3338	178
Na ₂ SO ₄	0.470	1.0550	365
Na ₂ SO ₄	1.002	1.1141	248
NaNO ₃	1.120	1.0560	423
NaNO ₃	1.370	1.0677	403
NaNO ₃	2.334	1.1141	335
NaNO ₃	3.350	1.1543	277
NaNO ₃	4.894	1.2152	216
Na ₃ PO ₄	0.220	1.0348	407
Na ₂ HPO ₄	0.402	1.0470	376
KCl.....	0.800	1.0334	453
KCl.....	1.301	1.0540	410
KCl.....	2.112	1.0850	355

C	M _C	d_4^{25}	$10^3\alpha_{25}$
KCl.....	3.570	1.1385	281
KCl.....	4.632	1.1734	240
KBr.....	1.160	1.0891	430
KBr.....	2.339	1.1752	351
KBr.....	4.992	1.3380	247
KIO ₄	0.0164	1.0008	521
K ₂ SO ₄	0.6165	1.0762	355
KNO ₃	1.0675	1.0586	448
KNO ₃	2.374	1.1231	383

Values of $10^3\alpha_t$ (48)

C	N_c	5	10	15	20
MgSO ₄	1.042	766	664	561	471
MgSO ₄	1.374	708	586	488	414
MgSO ₄	1.994	569	491	417	346
CaCl ₂	1.094	819	697	591	500
CaCl ₂	1.928	668	586	509	435
CaCl ₂	2.832	510	441	380	328
SrCl ₂	0.430	928	788	671	578
SrCl ₂	0.760	848	709	610	550
SrCl ₂	1.978	644	547	463	390
LiCl.....	0.319	986	831	700	594
LiCl.....	0.928	878	743	629	536
LiCl.....	2.883	606	512	437	382
Li ₂ SO ₄	0.438	934	792	670	569
Li ₂ SO ₄	1.042	795	665	557	474
Li ₂ SO ₄	1.672	646	555	477	415
NaCl.....	1.107	800	682	585	509
NaCl.....	1.614	713	603	510	434
NaCl.....	2.391	634	532	449	386
Na ₂ SO ₄	0.854	808	677	584	495
Na ₂ SO ₄	1.292	692	574	482	416
Na ₂ SO ₄	1.948	559	486	417	354
KCl.....	0.676	879	751	643	555
KCl.....	1.037	799	693	591	494
KCl.....	2.147	654	574	500	430
KCl.....	3.414	544	459	390	339
K ₂ SO ₄	0.308	986	831	701	605
K ₂ SO ₄	0.570	918	763	637	542

Values of $10^3\alpha_t$ (45)

C	N_c	15	25	C	N_c	15	25
NH ₄ Cl.....	0.5	692	510	KBr.....	0.5	661	491
NH ₄ Cl.....	1.0	655	485	KBr.....	1.0	594	444
LiCl.....	0.5	661	490	KI.....	0.5	665	496
LiCl.....	1.0	591	442	KI.....	1.0	600	451
KOH.....	0.5	633	471	RbCl.....	0.5	659	488
KOH.....	1.0	530	399	RbCl.....	1.0	592	442
KCl.....	0.5	650	483	CsCl.....	0.5	673	498
KCl.....	1.0	584	435				

C = NaCl

Values of $10^3\alpha_t$ (124)

M _C	5	10	15	20	25
0.1694	1061	881	734	619	536
0.3093	1003	838	703	596	519
0.665	913	770	650	552	478
1.003	843	709	598	509	442

C = NaNO₃

N_c	0.1336	0.3052	0.629	1.120	Lit.
$10^3\alpha_{20}$	609	588	546	493	(75)

$\text{N}_2\text{O} : \text{B} = \text{H}_2\text{O}$ —(Continued) $\text{C} = \text{KNO}_3$

N_{C}	0.1061	0.2764	0.563	1.168	Lit.
$10^3\alpha_{20}$	617	600	571	520	(75)

AQUEOUS SOLUTIONS OF ORGANIC COMPOUNDS

 $\text{C} = \text{C}_3\text{H}_8\text{O}_3$, GlycerolValues of $10^3\alpha_t$ (124)

$^{\circ}\text{C}$ \diagdown M_{C}	0.389	0.784	1.498	2.106
5	1097	1055	999	959
10	917	887	841	810
15	767	745	710	686
20	647	630	605	585
25	556	542	527	508

Values of $10^3\alpha_t$ (57)

M_{C}	$10^3\alpha_{15}$	M_{C}	$10^3\alpha_{20}$	M_{C}	$10^3\alpha_{20}$
0.0	733	0.0	630	1.6	549
0.2	722	0.2	619	1.8	541
0.4	711	0.4	608	2.0	533
0.6	700	0.6	598	2.2	527
0.8	690	0.8	588	2.4	522
1.0	680	1.0	577	2.6	517
1.2	669	1.2	567	2.8	512
1.4	659	1.4	558	3.0	508
1.6	649				
1.8	640				
2.0	632				
2.2	625				

 $\text{C} = \text{CH}_4\text{N}_2\text{O}$, UreaValues of $10^3\alpha_t$ (124)

$^{\circ}\text{C}$ \diagdown M_{C}	0.570	0.871	1.133	1.312	1.844
5	1104	1096	1088	1101	1069
10	921	920	909	921	901
15	771	773	761	772	761
20	653	656	644	655	651
25	569	567	559	570	569

M_{C}	1.0155	2.139	4.955	7.995	Lit.
d_4^{25}	1.0134	1.0287	1.0619	1.0905	(102)
$10^3\alpha_{25}$	510	492	463	445	

CO $\text{B} = \text{H}_2\text{O}$ $\text{C} = \text{H}_2\text{SO}_4$ (19)

x_{C}	0.0	0.1	0.25	0.6	0.8
$10^3\alpha_{20}$	23.13	10.23	9.22	16.1	20.92

 $\text{C} = \text{Cuprous ammonium carbonate and formate}$ Moles per liter: Cu, 0.84; HCOOH, 3.04; NH_3 , 6.52. Values of p_{CO} (mm Hg) and of v = volumes of CO at S. T. P. dissolved by 1 vol. of solution (83)

$p_{\text{CO}}, 0^{\circ}$	$v, 0^{\circ}$	$p_{\text{CO}}, 20^{\circ}$	$v, 20^{\circ}$	$p_{\text{CO}}, 40^{\circ}$	$v, 40^{\circ}$
12	4.59	62	3.85	64	1.17
33	8.29	141	6.67	128	1.91
73	11.56	239	9.08	$p_{\text{CO}}, 60^{\circ}$	$v, 60^{\circ}$
166	14.20	369	11.10	185	0.90
				331	1.49

The authors state that the results of this experiment are typical of all the experiments. For details of the solubilities in solutions

of other compositions, the original paper must be consulted. In general the solubility is proportional to the cuprous copper concentration, increases with increase in free NH_3 and is not greatly dependent on total carbonate or formate. At the higher temperatures the solubility approaches simple solution and approximates to Henry's Law. $\text{B} = \text{CHCl}_3$, Chloroform $\text{C} = \text{CH}_4\text{O}$, Methyl alcohol

x_{C}	0.0	0.4	1.0	Lit.
$10^3\alpha_{25}$	190	184.8	180	(131)

 $\text{B} = \text{CS}_2$, Carbon disulfide $\text{C} = \text{C}_2\text{H}_4\text{Cl}_2$, Ethylene chloride

x_{C}	0.0	0.2	0.5	0.8	1.0	Lit.
$10^3\alpha_{25}$	76	129.7	146.9	142.6	135	(131)

 $\text{B} = \text{CH}_4\text{O}$, Methyl alcohol $\text{C} = \text{C}_3\text{H}_8\text{O}_3$, Glycerol

x_{C}	0.0	0.3	0.5	0.7	1.0	Lit.
$10^3\alpha_{25}$	196	88.7	48.5	21.8	Very small	(131)

 $\text{B} = \text{C}_2\text{H}_4\text{O}_2$, Acetic acid (131) $\text{C} = \text{CHCl}_3$, Chloroform

x_{B}	0.7	0.0
$10^3\alpha_{25}$	180.8	189

 $\text{C} = \text{C}_6\text{H}_5\text{NO}_2$, Nitrobenzene

x_{B}	0.9	0.7	0.0
$10^3\alpha_{25}$	145.3	122.3	85

 $\text{C} = \text{C}_6\text{H}_6$, Benzene

x_{B}	0.75	0.40	0.20	0.00
$10^3\alpha_{25}$	181.3	181.1	172.2	159

 $\text{C} = \text{C}_6\text{H}_7\text{N}$, Aniline

x_{B}	1.0	0.9	0.7	0.3	0.0
$10^3\alpha_{25}$	158	98	68	53	49

 $\text{C} = \text{C}_7\text{H}_8$, Toluene

x_{B}	0.85	0.65	0.30	0.00
$10^3\alpha_{25}$	173	179.2	174.3	167

 $\text{B} = \text{C}_3\text{H}_6\text{O}$, Acetone (131) $\text{C} = \text{CHCl}_3$, Chloroform

x_{B}	0.8	0.4	0.0
$10^3\alpha_{25}$	206.7	193.5	190

 $\text{C} = \text{CS}_2$, Carbon disulfide

x_{B}	0.85	0.60	0.30	0.20	0.00
$10^3\alpha_{25}$	215.8	209.5	166	137.3	76

 $\text{C} = \text{C}_6\text{H}_5\text{NO}_2$, Nitrobenzene

x_{B}	0.9	0.7	0.6	0.0
$10^3\alpha_{25}$	193.6	151.8	136.2	85

 $\text{C} = \text{C}_6\text{H}_7\text{N}$, Aniline

x_{B}	1.0	0.9	0.8	0.6	0.0
$10^3\alpha_{25}$	218	177.7	145.6	105.5	49

 $\text{C} = \text{C}_{10}\text{H}_8$, Naphthalene

x_{B}	0.95	0.85
$10^3\alpha_{25}$	186	170

 $\text{C} = \text{C}_{10}\text{H}_8\text{O}$, β -Naphthol

x_{B}	0.95	0.90	0.85
$10^3\alpha_{25}$	178.7	161.8	149.5

 $\text{C} = \text{C}_{14}\text{H}_{10}$, Phenanthrene

x_{B}	0.95	0.90
$10^3\alpha_{25}$	185.8	166.2

B = C ₆ H ₆ (131)						
C = C ₂ H ₆ O, Ethyl alcohol						
x _B	0.4	0.3	0.0			
10 ³ α ₂₅	165	167.3	176			
C = C ₆ H ₅ NO ₂ , Nitrobenzene						
x _B	0.8	0.6	0.5	0.0		
10 ³ α ₂₅	138.5	119.7	111.7	85		
C = C ₆ H ₇ N, Aniline						
x _B	0.9	0.8	0.7	0.5	0.2	0.0
10 ³ α ₂₅	143	127	113	88	60	49
C = C ₁₀ H ₈ , Naphthalene						
x _C	1.0	0.9	0.8	0.7		
10 ³ α ₂₅	174	146.6	134	121.3		
C = C ₁₀ H ₈ O, α-Naphthol						
x _B	0.98			0.93		
10 ³ α ₂₅	136.5			126.8		
C = C ₁₀ H ₈ O, β-Naphthol						
x _B	0.99			0.97		
10 ³ α ₂₅	147			133		
C = C ₁₄ H ₁₀ , Phenanthrene						
x _B	0.95			0.85		
10 ³ α ₂₅	131.8			115		
B = C ₇ H ₈ , Toluene (131)						
C = C ₆ H ₅ NO ₂ , Nitrobenzene						
x _B	1.00	0.85	0.60	0.30	0.00	
10 ³ α ₂₅	167	146	121	99.6	85	
C = C ₆ H ₇ N, Aniline						
x _B	1.0	0.9	0.8	0.6	0.4	0.2
10 ³ α ₂₅	167	145	134	112	91	70
C = C ₁₀ H ₈ , Naphthalene						
x _B	1.0	0.95	0.90	0.85	0.80	
10 ³ α ₂₅	167	158	150	142	134	
C = C ₁₀ H ₈ O, α-Naphthol						
x _B	1.0	0.97		0.94		
10 ³ α ₂₅	167	156.5		147		
C = C ₁₄ H ₁₀ , Phenanthrene						
x _B	1.00	0.97	0.94	0.87		
10 ³ α ₂₅	167	156	147.5	134		

CO₂
B = H₂O
AQUEOUS SOLUTIONS OF ELECTROLYTES
For pure H₂O α₁₅ = 1.014, α₂₅ = 0.7563

C	N _C					
	0.5	1.0	2.0	0.5	1.0	2.0
	10 ³ α ₁₅ (45)			10 ³ α ₂₅ (45)		
HCl.....	989	974	948	738	732	728
½H ₂ SO ₄	965	927	869	727	705	669
HNO ₃	1022	1029	1043	770	781	803
KCl.....	925	850		695	641	
KBr.....	935	866		704	653	
KI.....	940	875		710	666	
KNO ₃	953	897		718	684	
RbCl.....	938	873		705	658	
CsCl.....	954			716		

C	N _C		10 ³ α ₁₅		10 ³ α ₂₅		Lit.
	3.0	4.0	3.0	4.0	3.0	4.0	
½H ₂ SO ₄	825	785	639	611			(45)

C = H ₂ SO ₄							
x _C	0.0	0.093	0.2	0.3	0.6	0.8	Lit.
10 ³ α ₂₀	901	608	656	701	835	923	(19)
10 ³ α _{20.2}					873	926	(11)

C = NH ₄ Cl							
N _C	0.0	0.5	1.0	1.5	2.0	3.2	Lit.
d.....		1.006	1.014	1.021	1.029	1.045	(36)
10 ³ α ₂₅	756	720	692	668	648	609	

C = Fe(NH ₄) ₂ (SO ₄) ₂				C = BaCl ₂ (36)		
N' _C	d	10 ³ α ₂₅		N _C	d	10 ³ α ₂₅
0.3	1.047	604		0.2	1.013	732
0.4	1.062	560		0.6	1.043	678
0.8	1.125	419		0.8	1.058	646
Lit.	(36)			1.0	1.073	612

C = NaCl					
Values of 10 ³ α _t (10)					
°C	M _C	1.195	3.659	°C	M _C
0		1234	678	35	
5		1024	577	40	
10		875	503	45	
15		755	442	50	
20		664	393	55	
25		583	352	60	
30		517	319		
				462	288
				415	263
				378	239
				350	221
				328	204
				310	190

C = KCl						
N _C	0.0	0.3	0.5	0.8	1.0	Lit.
d.....		1.011	1.021	1.035	1.044	(36)
10 ³ α ₂₅	756	719	695	662	642	

AQUEOUS SOLUTIONS OF ORGANIC COMPOUNDS					
Values of 10 ³ α ₂₀ for N _C = 0.5 (142)					
C	d ₂₀ ²⁰	10 ³ α ₂₀	C	d ₂₀ ²⁰	10 ³ α ₂₀
Dextrose.....	1.0328	792	Urethane.....	1.0037	869
Mannitol.....	1.03031	782	Urea.....	1.00715	864
Glycocoll.....	1.01413	843	Thiourea.....	1.00917	859
Pyrogallol.....	1.01718	853	Antipyrine.....	1.01339	859
Hydroquinol...	1.00946	887	Acetamide....	1.0005	879
Resorcinol....	1.00958	901	Acetic acid....	1.0026	868
Pyrocatechol..	1.0107	868	n-Propyl alcohol	0.9939	869

C = C ₂ H ₆ O, Ethyl alcohol					
x _C	d ₄ ²⁰ (112.5)	α ₂₀ (109)	x _C	d ₄ ²⁰ (112.5)	α ₂₀ (109)
0.00	0.998	0.88	0.50	0.8635	1.50
0.05	0.982	0.84	0.70	0.829	1.99
0.10	0.966	0.808	0.99	0.791	2.71
0.14	0.9545	0.793	N' _C	d ₁₅ ²⁵	α ₂₀ (35)
0.20	0.937	0.843	0.7	0.9926	0.7435
0.25	0.923	0.935	1.9	0.98355	0.7202
0.30	0.910	1.044			

C = C ₃ H ₈ O ₃ , Glycerol (53)						
M _C	0.0	1.0	2.5	4.5	7.0	10.0
10 ³ α ₁₅	1008	934	847	758	676	608
M _C	16.0	25.0	42.0	98.0	205.0	∞
10 ³ α ₁₅	528	467	426	414	413	(pure glyc.)
						411

$\text{CO}_2 : \text{B} = \text{H}_2\text{O}$.—(Continued)
 $\text{C} = \text{C}_2\text{H}_3\text{Cl}_3\text{O}_2$, Chloral hydrate⁽⁵³⁾

M_C	$10^3\alpha_{15}$	M_C	$10^3\alpha_{15}$	M_C	$10^3\alpha_{15}$
0.0	1008	4.0	776	12.0	789
1.0	904	7.0	765	14.0	804
2.0	841	8.0	768	24.0	908
3.0	797	9.0	773		
N'_C	d	$10^3\alpha_{25}$	Lit.		
0.3	1.0185	747.5	(36)		
0.6	1.0401	728.7			

$\text{C} = \text{C}_6\text{H}_7\text{N}$, Aniline

N'_C	0.02	0.04	0.06	0.08	Lit.
$10^3\alpha_{25}$	783	818	849	864	(31)

$\text{C} = \text{C}_{12}\text{H}_{22}\text{O}_{11}$, Sucrose

N'_C	d_{20}^{20}	$10^3\alpha_{20}$	N'_C	d	$10^3\alpha_{25}$ (36)
0.1250	1.01518	846	0.0		756.3
0.2500	1.03125	815	0.05	1.0057	749
0.500	1.06372	756	0.10	1.0117	741
1.000	1.12809	649	0.15	1.0179	732
Lit.	(142)		0.25	1.0326	711
			0.30	1.0409	698.6
			0.35	1.0493	685

CH_4

$\text{B} = \text{H}_2\text{O}$

$\text{C} = \text{H}_2\text{SO}_4$ (19)

M_C	0.0	5.70	16.40	221.0
$10^3\alpha_{20}$	35.00	16.90	13.12	30.76

C_2H_2 (102)

$\text{B} = \text{H}_2\text{O}$

C	M_C	d_4^{25}	$10^3\alpha_{25}$
NH_4Cl	1.137	1.0141	827
NH_4Cl	2.381	1.0294	747
NH_4Cl	5.254	1.0600	643
NH_4Br	1.125	1.0540	844
NH_4Br	2.372	1.1100	788
NH_4Br	5.323	1.2215	686
$(\text{NH}_4)_2\text{SO}_4$	1.511	1.0911	524
$(\text{NH}_4)_2\text{SO}_4$	2.727	1.1501	363
ZnSO_4	0.926	1.1359	549
ZnSO_4	1.884	1.2666	319
$\text{Zn}(\text{NO}_3)_2$	0.860	1.1210	745
$\text{Zn}(\text{NO}_3)_2$	1.789	1.2406	597
MnSO_4	1.000	1.1283	548
MnSO_4	2.053	1.2507	314
FeCl_3	0.855	1.1030	630
FeCl_3	1.402	1.1638	516
FeSO_4	0.726	1.1017	616
FeSO_4	1.463	1.2011	411
$\text{Fe}_2(\text{SO}_4)_3$	0.687	1.2240	458
$\text{Fe}_2(\text{SO}_4)_3$	1.460	1.4319	227
CoSO_4	0.805	1.1139	588
CoSO_4	1.632	1.2238	371
NiSO_4	0.741	1.1096	599
NiSO_4	1.495	1.2156	380
$\text{Cr}_2(\text{SO}_4)_3$	0.605	1.1657	567
$\text{Cr}_2(\text{SO}_4)_3$	1.294	1.3280	324
AlCl_3	0.633	1.0672	623
AlCl_3	1.107	1.1150	471
$\text{Al}_2(\text{SO}_4)_3$	0.528	1.1558	416
$\text{Al}_2(\text{SO}_4)_3$	0.849	1.2381	254
$\text{Al}(\text{NO}_3)_3$	0.577	1.0822	755

C	M_C	d_4^{25}	$10^3\alpha_{25}$
$\text{Al}(\text{NO}_3)_3$	1.0955	1.1502	629
MgCl_2	1.132	1.0802	584
MgCl_2	2.246	1.1501	397
MgSO_4	0.904	1.0999	548
MgSO_4	1.832	1.1944	311
$\text{Mg}(\text{NO}_3)_2$	0.999	1.0916	743
$\text{Mg}(\text{NO}_3)_2$	2.1105	1.1821	598
CaCl_2	0.979	1.0806	606
CaCl_2	2.1705	1.1675	391
$\text{Ca}(\text{NO}_3)_2$	1.474	1.1503	648
$\text{Ca}(\text{NO}_3)_2$	3.232	1.2927	441
BaCl_2	0.645	1.1085	675
BaCl_2	1.376	1.2266	491
NaCl	1.147	1.0420	706
NaCl	2.372	1.0850	541
NaCl	5.012	1.1660	320
NaBr	1.1575	1.0829	727
NaBr	2.3925	1.1668	579
NaBr	5.152	1.3307	361
Na_2SO_4	0.4734	1.0538	670
Na_2SO_4	0.9925	1.1111	476
NaNO_3	1.1205	1.0556	785
NaNO_3	2.330	1.1106	667
NaNO_3	5.072	1.2189	490
KCl	1.956	1.0807	653
KCl	4.176	1.1588	481
KBr	1.139	1.0866	779
KBr	2.381	1.1750	655
KBr	5.272	1.3459	478
K_2SO_4	0.611	1.0753	649
KNO_3	1.129	1.0618	824
KNO_3	2.376	1.1232	737

Values of α_{15} (= 1.186 for pure H_2O) (7)

N_C	0.01	0.025	0.05	0.10	0.15
C					
$\frac{1}{2}\text{H}_2\text{SO}_4$				1.128	
NH_4OH	1.153			1.155	
$\frac{1}{2}\text{Ca}(\text{OH})_2$	1.166				
$\frac{1}{2}\text{Ba}(\text{OH})_2$		1.155		1.166	1.175
NaOH	1.147		1.138	1.119	
$\frac{1}{2}\text{Na}_2\text{SO}_4$				1.109	
KOH	1.149			1.123	

N_C	0.25	0.50	1.00	2.00	3.00
C					
$\frac{1}{2}\text{H}_2\text{SO}_4$		1.062	0.986	0.853	0.739
NH_4OH	1.156	1.161	1.166	1.171	1.175
NaOH	1.069	0.986	0.839	0.569	0.351
$\frac{1}{2}\text{Na}_2\text{SO}_4$	1.012	0.891	0.683	0.322	
KOH	1.071	1.001	0.865	0.626	0.436

C_2H_4

$\text{B} = \text{H}_2\text{O}$

Values of $10^3\alpha_{15}$ (= 151 for pure H_2O) (7)

N_C	0.1	0.25	0.50	0.75	1.0
C					
NH_4OH		149	148	147	146
$\frac{1}{2}\text{Na}_2\text{SO}_4$	145	135	120	103	88
NaOH	145	137	121	108	96
KOH	146	137	123	112	100

CH₃Cl
Methyl chloride
B = H₂O
C = HCl
Values of α_i (115)

N_c	0.0	1.0	2.0	6.0	12.0
°C					
20	2.86	2.44	2.60	2.44	2.39
30	1.95	1.68	1.97	1.87	1.17
40	1.40	1.26	1.55	1.40	0.19*
50	1.05	0.96	1.20	1.00	
60	0.76	0.75	0.94	0.72	
70	0.61	0.61	0.78	0.53	
80	0.52	0.56	0.67	0.43	

* 38.5°C.

SOLUBILITY OF GASES IN COLLOIDAL SOLUTIONS IN WATER

Some typical examples: B = H₂O in all cases**Rn, Radon**C = SiO₂-hydrosol (30)At $N'_c = 0.29$, $\alpha_{17} = 0.242$ to 0.280.**H₂**

C = Gelatin* (36)

g C/l.....	0.0	10.0	30.0	50.0	60.0
d_4^{25}		1.000	1.006	1.012	1.016
$10^3\alpha_{25}$	18.0	17.77	17.3	16.8	16.56

* The average deviation from Henry's law is about 0.8 % from $p = 750$ to 1400 mm.

C = Starch* (36)

g C/l.....	0.0	20.0	50.0	90.0
d_4^{25}		1.005	1.017	1.031
$10^3\alpha_{25}$	18.0	17.7	17.2	16.6

C = Dextrin* (36)

g C/l.....	0.0	40.0	60.0	80.0	190.0
d_4^{25}		1.012	1.0205	1.0276	1.065
$10^3\alpha_{25}$	18.0	17.7	17.5	17.3	15.93

* Henry's law holds from $p = 700$ to 1400 mm.**CO₂**

C = Gelatin

26.0 g C/l; $d = 1.006$ (37)

p (mm).....	250	400	500	650	750
λ_{25}	0.857	0.843	0.836	0.831	0.833

49.0 g C/l; $d = 1.012$ (37)

p (mm).....	250	450	650	750
λ_{25}	0.871	0.848	0.839	0.838

10.6 g C/l; $d = 0.999$ (31) $\lambda_{25} = 0.815$ between $p = 740$ and 1370 mm16.8 g C/l; $d = 1.000$ (31) $\lambda_{25} = 0.817 \pm 0.001$ between $p = 740$ and 1325 mm.33.6 g C/l; $d = 1.003$ (31) $\lambda_{25} = 0.826$ at $p = 740$; $\lambda = 0.819 \pm 0.001$ between $p = 825$ and 1390 mm.60.9 g C/l; $d = 1.008$ (31)

p (mm).....	750	850	950	1050	1200	1400
λ_{25}	0.8345	0.8265	0.824	0.8242	0.825	0.826

C = Starch

46.0 g C/l; $d = 1.018$ (37)* $\lambda_{25} = 0.787 \pm 0.002$ between $p = 260$ and 735 mm.51.0 g C/l; $d = 1.021$ (37)* $\lambda_{25} = 0.783$ between $p = 265$ and 738 mm91.3 g C/l; $d = 1.035$ (37)*

p (mm).....	250	400	500	650	750
λ_{25}	0.751	0.754	0.756	0.759	0.761

* The authors state that the solubility is not affected by changes in the method of preparation of the starch; v. (34).

25.0 g C/l; $d = 1.009$ (31)

p (mm).....	750	850	950	1050	1200	1350
λ_{25}	0.796	0.7975	0.799	0.801	0.804	0.8065

50.0 g C/l; $d = 1.016$ (31)

p (mm).....	750	850	1000	1200	1300
λ_{25}	0.778	0.7803	0.7837	0.788	0.7903

75.0 g C/l; $d = 1.023$ (31)

p (mm).....	750	850	1000	1100	1200	1350
λ_{25}	0.762	0.764	0.7673	0.7694	0.7715	0.7747

100 g C/l; $d = 1.030$ (31)

p (mm).....	760	900	1000	1100	1200	1350
λ_{25}	0.750	0.753	0.755	0.757	0.759	0.762

C = Dextrin

50.0 g C/l; $d = 1.018$ (37)

p (mm).....	250	400	500	600	700	750
λ_{25}	0.816	0.807	0.803	0.801	0.800	0.799

194.0 g C/l; $d = 1.065$ (37)

p (mm).....	250	400	500	700	750
λ_{25}	0.743	0.730	0.726	0.721	0.722

35.0 g C/l; $d = 1.008$ (31) $\lambda_{25} = 0.800 \pm 0.001$ between $p = 750$ and 1260 mm.56.0 g C/l; $d = 1.015$ (31)

p (mm).....	750	850	1000	1100	1250
λ_{25}	0.785	0.785	0.786	0.7876	0.791

95.0 g C/l; $d = 1.034$ (31)

p (mm).....	750	850	950	1100	1300
λ_{25}	0.761	0.758	0.759	0.762	0.7685

130.0 g C/l; $d = 1.040$ (31)

p (mm).....	750	800	900	1000	1150	1250
λ_{25}	0.744	0.741	0.743	0.746	0.749	0.751

189.0 g C/l; $d = 1.064$ (31)

p (mm).....	750	850	950	1050	1200	1350
λ_{25}	0.7146	0.710	0.7134	0.7163	0.7207	0.7252

206.0 g C/l; $d = 1.069$ (31)

p (mm).....	750	850	900	1000	1150	1350
λ_{25}	0.7017	0.6972	0.6979	0.699	0.701	0.704

C = Egg Albumen (37)

1.05 g C/l; $d = 0.992$

p (mm).....	268	389	484	770
λ_{25}	0.826	0.816	0.819	0.819

2.1 g C/l; $d = 0.995$

p (mm).....	269	387	483	664	772
λ_{25}	0.844	0.827	0.823	0.826	0.824

C = Serum Albumin (31)

4.4 g C/l; $d = 0.998$

p (mm).....	750	850	950	1100	1250	1400
λ_{25}	0.804	0.801	0.802	0.8045	0.806	0.806

12.9 g C/l; $d = 1.000$

p (mm).....	750	850	950	1050	1250	1430
λ_{25}	0.7786	0.7746	0.779	0.783	0.789	0.792

CO₂.—(Continued)

C = Glycogen (31)

3.4 g C/l; $d = 0.998$

$p(\text{mm})$	750	850	950	1150	1400
λ_{25}	0.820	0.806	0.810	0.810	0.810

6.8 g C/l; $d = 1.000$

$p(\text{mm})$	750	850	950	1100	1400
λ_{25}	0.817	0.8045	0.807	0.807	0.807

C = Peptone (36)*

g C/l.....	0.0	10.0	20.0	30.0
d		0.9997	1.003	1.0068
α_{25}	0.756	0.787	0.810	0.831

* The average deviation from Henry's law from $p = 750$ to 1360 mm is about 1 %.

C = Propeptone (36)*

g C/l.....	0.0	3.0	8.0
d		0.998	1.000
α_{25}	0.756	0.764	0.773

* The average deviation from Henry's law from $p = 740$ to 1360 mm is about 0.4 %.

C = Hemoglobin (36)*

g C/l.....	0.0	2.0	5.0	8.0
d		0.998	0.9991	1.0001
α_{25}	0.756	0.762	0.780	0.806

* The average deviation from Henry's law from $p = 730$ to 1340 mm is about 0.8 %.C = As₂S₃ (31)3.92 g C/l; $d = 0.997$

$p(\text{mm})$	750	950	1050	1150	1250
λ_{25}	0.816	0.814	0.816	0.8177	0.8198

14.10 g C/l; $d = 1.003$ $\lambda_{25} = 0.811 \pm 0.001$ between $p = 750$ and 1280 mm.22.89 g C/l; $d = 1.007$ $\lambda_{25} = 0.806$ between $p = 750$ and 1210 mm.

C = Bone Charcoal (31)

2.36 g C/l; $d = 1.000$

$p(\text{mm})$	750	800	900	1050	1150	1250	1372
λ_{25}	0.8156	0.821	0.842	0.885	0.914	0.940	(0.950)

C = Silicic acid

2.53 g SiO₂/l; $d = 1.000^*$ (31)

$p(\text{mm})$	750	850	950	1050	1200	1300	1400
λ_{25}	0.814	0.8155	0.817	0.819	0.8214	0.823	0.8247

* Suspension of SiO₂ in water. According to Findlay and Williams (37) suspensions of SiO₂ give same values as pure water.4.5 g SiO₂/l; $d = 0.996$ (37) $\lambda_{25} = 0.816 \pm 0.001$ between $p = 267$ and 762 mm9.5 g SiO₂/l; $d = 0.999$ (37)

$p(\text{mm})$	260	400	500	650	750
λ_{25}	0.837	0.824	0.820	0.816	0.822

12.5 g SiO₂/l; $d = 1.000$ (37)

$p(\text{mm})$	265	400	500	650	750
λ_{25}	0.842	0.827	0.823	0.821	0.823

14.0 g SiO₂/l; $d = 1.000$ (31)

$p(\text{mm})$	730	830	940	1355
λ_{25}	0.822	0.819	0.816	0.816

22.0 g SiO₂/l; $d = 1.002$ (31)

$p(\text{mm})$	730	830	940	1335
λ_{25}	0.828	0.822	0.820	0.820

28.0 g SiO₂/l; $d = 1.003$ (31)

$p(\text{mm})$	730	870	950	1330
λ_{25}	0.831	0.825	0.824	0.824

C = Fe(OH)₃5.69 g C/l; $d = 1.000$ (31)

$p(\text{mm})$	750	850	950	1050	1350
λ_{25}	0.848	0.843	0.841	0.842	0.845

6.3 g C/l; $d = 1.003$ (37)

$p(\text{mm})$	250	350	450	600	750
λ_{25}	1.044	0.986	0.953	0.922	0.903

8.54 g C/l; $d = 1.003$ (31)

$p(\text{mm})$	750	850	950	1050	1250	1350
λ_{25}	0.862	0.858	0.856	0.857	0.860	0.8615

12.6 g C/l; $d = 1.006$ (37)

$p(\text{mm})$	240	300	400	600	750
λ_{25}	1.272	1.188	1.119	1.024	0.987

12.77 g C/l; $d = 1.005$ (31)

$p(\text{mm})$	750	850	1000	1100	1250
λ_{25}	0.886	0.881	0.877	0.878	0.886

16.61 g C/l; $d = 1.009$ (31)

$p(\text{mm})$	750	850	1000	1150	1300
λ_{25}	0.904	0.901	0.900	0.9005	0.903

C = Methyl Orange (36)*

g C/l.....	0.0	3.0	6.0	9.0
d		0.998	1.002	1.004
α_{25}	0.756	0.770	0.803	0.859

* The average deviation from Henry's law in these solutions is about 1.5 % from $p = 730$ to 1340 mm.**N₂O**

NOTE.—The following solutions were freed from air by boiling under reduced pressure and where necessary were purified by dialysis. The maximum deviation in the values obtained from two series of experiments was usually ± 0.002 , although graphs of the results sometimes indicate a maximum error somewhat greater than this. The results confirm earlier data at higher pressures by Findlay and Creighton (31).

C = Gelatin (33)

14.5 g C/l; $d = 1.000$

$p(\text{mm})$	260	370	550	600	750	1000
λ_{25}	0.583	0.580	0.576	0.5756	0.576	0.581

31.2 g C/l; $d = 1.004$

$p(\text{mm})$	250	350	550	650	750	1000
λ_{25}	0.577	0.573	0.568	0.569	0.571	0.576

61.0 g C/l; $d = 1.008$

$p(\text{mm})$	260	350	550	650	750	1000
λ_{25}	0.557	0.554	0.548	0.547	0.548	0.556

C = Soluble Starch (33)

67.0 g C/l; $d = 1.023$

$p(\text{mm})$	260	400	500	650	750	1000
λ_{25}	0.5601	0.563	0.5605	0.557	0.5547	0.5487

94.0 g C/l; $d = 1.029$

$p(\text{mm})$	290	400	550	650	750	1000
λ_{25}	0.552	0.550	0.548	0.545	0.5425	0.537

136.0 g C/l; $d = 1.039$

$p(\text{mm})$	260	350	500	650	750	1000
λ_{25}	0.5415	0.5382	0.536	0.5325	0.5302	0.5245

C = Dextrin (33)68.2 g C/l; $d = 1.019$

$p(\text{mm})$	280	400	600	700	800	1000
λ_{25}	0.557	0.550	0.5418	0.5423	0.545	0.555

124.1 g C/l; $d = 1.037$

$p(\text{mm})$	280	400	600	700	800	1000
λ_{25}	0.5373	0.5321	0.526	0.525	0.5262	0.535

192.4 g C/l; $d = 1.060$

$p(\text{mm})$	280	400	600	700	800	1000
λ_{25}	0.5159	0.5102	0.5036	0.5010	0.500	0.5062

C = Egg Albumen (33)3.8 g C/l; $d = 0.998$ From $p = 250$ to 1000 mm, $\lambda_{25} = 0.572 \pm 0.0005$ 6.1 g C/l; $d = 1.000$ From $p = 250$ to 1000 mm, $\lambda_{25} = 0.568 \pm 0.001$ **C = Carbon (33)**

30.0 g C/l

$p(\text{mm})$	250	400	550	560	750	1000
λ_{25}	0.583	0.581	0.584	0.588	0.593	0.610

C = SiO₂ (33)16.2 g C/l; $d = 1.000$

$p(\text{mm})$	250	400	550	700	750	1030
λ_{25}	0.599	0.596	0.594	0.593	0.594	0.598

35.0 g C/l; $d = 1.004$

$p(\text{mm})$	250	400	550	700	750	1030
λ_{25}	0.594	0.591	0.589	0.588	0.588	0.591

C = Fe(OH)₃ (33)4.3 g C/l; $d = 1.001$

$p(\text{mm})$	250	400	600	800	1000
λ_{25}	0.595	0.593	0.5897	0.5855	0.580

9.2 g C/l; $d = 1.003$

$p(\text{mm})$	250	400	600	800	1000
λ_{25}	0.590	0.587	0.5835	0.5796	0.575

38.2 g C/l; $d = 1.027$

$p(\text{mm})$	250	400	600	800	1000
λ_{25}	0.583	0.5807	0.5772	0.573	0.567

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(For a key to the periodicals see end of volume)

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PARTIAL VAPOR PRESSURES FROM ALLOYS, AMALGAMS AND SOLUTIONS OF METALS IN LIQUID AMMONIA

J. JOHNSTON

Hg
Fractional vapor pressure of mercury (p/p_0 where p is pressure over the amalgam with the metal M, p_0 the vapor pressure of Hg at the same temperature) in equilibrium with amalgams containing mercury at the mole fraction x .

M	°C	x (mole fraction Hg)									Lit.
		0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1	
Bi	320-2	0.931	0.872	0.796	0.710	0.614	0.509	0.394	0.271	0.140	(3)
Cd	322	.890	.765	.630	.487	.340	.213	.150	.085	.012	(8)
K	ca. 0	.15									(14)
Na	ca. 0	.65	.15	.02	10^{-3}	10^{-5}					(14)
Pb	324	.937	.895	.850	.780	.695	.587	.470	.327	.170	(8)
Sn	324	.944	.905	.856	.778	.688	.575	.448	.312	.162	(8)
Tl	324	.883	.764	.644	.535	.437	.341	.250	.165	.082	(7)
Zn	300	.913	.828	.750	.667	.577	.484				(6)

M	x (mole fraction Hg) $t = ca. 357^\circ\text{C}$							Lit.
	0.99	0.98	0.97	0.96	0.94	0.92	0.90	
Ag	0.990	0.980	0.972	0.965	0.951			(1, 15)
Al	.993	.985						(15)
Au	.991	.983	.975	.969				(1, 15)
Ba	.982							(15)
Bi	.992	.984	.976	.969	.954	0.941	0.931	(1, 3, 15)
Ca	.988	.973	.955	.931	.865	0.70 for $x = 0.86$ (satd. soln.)		(1, 2, 15)
Cd	.990	.979	.968	.958	.936	.914	.890	(1, 8, 15)
Ga	.990	.980						(15)
K	.987	.969	.950					(1, 15)
Li	.990	.980						(15)
Mg	.988	.976	.964	.952	.928	0.39 for $x = 0.64$ (satd. soln.)		(1, 2, 15)
Mn	.987							(15)
Na	.989	.977	.962	.945	.907			(1, 15)
Pb	.991	.983	.976	.969	.957	.947	.937	(1, 8, 15)
Sb	.992	.984						(15)
Sn	.991	.983	.976	.970	.960	.951	.944	(1, 8, 15)
Tl	.990	.979	.969	.958	.935	.911	.883	(1, 7, 15)
Zn	.991	.981	.971	.962	.945	.928	.913	(1, 6, 15)

Zn
Fractional vapor pressure of zinc (p/p_0 , where p is the pressure over the alloy, p_0 that of pure zinc at the same temperature) in equilibrium with brasses containing zinc at the mole fraction x (4, 5, 10).

Temperature range	100x (mole % Zn)								Lit.
	45	40	35	30	25	20	15	10	
900-1350°	0.32	0.27	0.21	0.15	0.10	0.06	0.03	0.02	

NH₃
Relative vapor pressure of NH₃, p/p_0 (where p is its vapor pressure over the solution designated, p_0 that of pure liquid NH₃ at the same temperature) over solutions of metals in liquid NH₃. Solutions saturated with the metal M (*i.e.*, solid phase is pure M).

$t, ^\circ\text{C}$	30	20	10	± 0	-10	-20	-30	Lit.
	$10^3 p/p_o$ for saturated solutions							
Ca*	1.68	1.27	0.95	0.70	0.52	0.38	0.26	(11)
Li	1.94	1.53	1.25	1.03	0.89	0.78	0.70	(11)
Na	540	534	530	527	524	521	519	(9)

* In presence of the solid phase $[\text{Ca}(\text{NH}_3)_6]$, the vapor pressure of NH₃, p , is 471.8 mm at -32.5° and 192.8 mm at -50° .

Unsaturated solutions of Li, of mole fraction x with respect to NH₃, at -39.4° (12)

$x =$	1.00	0.98	0.96	0.94	0.92	0.90	0.86	0.82	0.783 (satd.)
$p/p_0 =$	1.00	0.973	0.973	0.963	0.942	0.908	0.757	0.418	0.0065

Solutions of the complex telluride, Na₂Te₃; temp. 18-20° (13)

$x =$	1.00	0.998	0.996	0.994	0.992	0.990
$p/p_0 =$	1.000	0.9990	0.9979	0.9968	0.9957	0.9946

LITERATURE

(For a key to the periodicals see end of volume)

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TWO-PHASE LIQUID—VAPOR SYSTEMS AT CONSTANT TEMPERATURE, TWO COMPONENTS VOLATILE, PARTIAL AND TOTAL VAPOR PRESSURES*

ALFONS KLEMENC

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P , p , total, resp. partial vapor pressure.
 x , mole fraction.
"Ideal," Each partial pressure is (within the accuracy of the data) given by the expression $p_A = p_0 x_A$ where p_0 is p_A for $x_A = 1$.
Values of the vapor pressures of the pure liquids recorded in the following tables are those given by the observer. They usually differ more or less from the "best" values, *q.v.* p. 201, 202, 213.

I. TWO-COMPONENT SYSTEMS
(a) Non-Aqueous Systems

1. ONE COMPONENT A NON-METALLIC ELEMENT

*See also "Vapor-Pressure Lowering," p. 292, "Solubility of Gases," p. 254 and "P-T-X Relations," p. 351.

A	
Argon	
B = O ₂ , v. p. 351	
B = N ₂ (47); cf. p. 309, 351	
-188.0°	
Vol % B	P in mm
0.0	602.8
10.0	747.8
31.5	1005
65.3	1379
82.6	1562
100.0	1743
Let $x_A/x_B = r$ (in liquid),	

and $x_A/x_B = r'$ (in gas) then
 $\log_{10} r = 1.11$; $\log_{10} r' = 0.466$.

O ₂	
B = N ₂ , v. p. 309, 351	
Cl ₂	
B = COCl ₂ , v. p. 353	
Br ₂	
B = I ₂ , v. p. 354	
B = CCl ₄ (70)	
At 25°, p_A (mm) = 410.7 x_A , in region $x_A = 0$ to 0.025.	

2. BOTH COMPONENTS CHEMICAL COMPOUNDS
 B-Table, standard arrangement, v. p. viii
HClB = N₂O (56.5) *P* in mm

100x _B	-100°	-95°	-90°	100x _B	-100°	-95°	-90°
0	293	411	561	30	339	472	644
10	308	432	589	40	353	491	671
20	323	453	617	50	366	507	696

B = C₂H₆O (33, 61)

Methyl ether

SO₂B = CO₂ (10)*P* in atm. (± 2 to 13 %)

See also p. 354

Wt. % B	5	10	15	20	25	30
-17	2.6	4.3	6.8			
0	4.0	6.3	8.30	10.30	12.5	(14.7)
+10	5	8.3	10.9	13.0	15.6	(18.6)
30	9.2	13.5	16.6	20.2	24.0	
35	10.3	15.0	18.6	22.3	26.3	(31.5)

B = C₂H₆O (11)

Methyl ether

P at 56.1°, 77.1°, 108.7°

Not very accurate

NO₂B = N₂O₃ (7)*P* in mm

Wt. % B	0	20	40	60	80	100
-24		110	170	268	460	865
-16		168	260	409	685	1250
-8	172	262	398	623	1018	1785
0	266	400	600	925	1475	2480
+8	396	590	882	1331	2072	3360
16	598	860	1270	1857	2825	4430
20	684	1040	1520	2130	3260	5000

Extrapolated

N₂OB = C₁₀H₁₄N₂ Nicotine at 59.6°
Slightly > 1st crit. soln. temp.

Wt. % B	<i>P</i> in mm	Lit.
17.22	137.5 ± 0.3	(104)
82.10	132.1 ± 0.7	

N₂O₃B = N₂O₄, v. p. 355**SnCl₄**B = C₆H₆ (108)*P* at 100°, 125°

For systems composed of two carbon compounds, v. Part 3.

NaClB = KCl (38); *P* in mm

Wt. % A	0	20	50	70	100
870	2.6	2.0	1.2	0.8	0.45
890	3.5	2.8	1.86	1.3	0.67
910	4.6	3.8	2.7	2.1	1.1
920	5.2	4.4	3.2	2.5	1.5
930	5.7	(4.9)	3.7	2.9	1.9

t° | Wt. % A | *p*_B(mm) | *p*_A(mm)

900	15	3.36	0.1
920	43	2.6	0.9
940	69	1.5	2.0
950	82	0.84	2.66

Na₂CO₃B = NaCN (49); *P* in mm

<i>t</i> °	1000 ± 1	1100 ± 1
<i>P</i>	12.8x _B	35.2x _B

 3. BOTH COMPONENTS CARBON COMPOUNDS WITH KEY-FORMULAE
 BEGINNING WITH 16
C-Table. The C-arrangement in order of the components ("A")
having the lowest C-formulae (v. p. viii)**CCl₄**B = CS₂ (12, 13, 14, 91, 102)*P* at 0, 10, 20, 30, 60, 80°B = C₂H₅I Ethyl iodide (142);
cf. (93, 94)49.99°, *p* in mm (± 1.5)

100x _B	<i>p</i> _A	<i>p</i> _B
0	306	0
3.64	296	15
8.84	282	37
19.66	250	79
28.50	227	111
40.26	193	154
49.33	167	184
100	0	354

B = C₂H₆O Ethyl alcohol, v. p.
358B = C₄H₈O₂ Ethyl acetate
(142); cf. (93, 94)49.99°, *p* in mm (± 0.8)

100x _B	<i>p</i> _A	<i>p</i> _B
0	306.0	0
9.65	276.8	34.4
11.97	272.0	42.6
19.78	249.5	67.0
21.49	245.5	72.3
32.65	214.1	103.0
32.57	214.8	103.9
42.50	189.6	126.5
59.84	136.5	175.0
68.38	110.4	196.5
74.81	90.1	213.3
80.64	70.7	228.4
84.88	56.2	239.7
100	0	280.5

B = C₆H₅NO₂ Nitrobenzene (71); cf. (57, 67, 141)*P* and *p*B = C₆H₆ (102, 106, 107.5); *P* in mm

100x _A	<i>P</i> ₀	<i>P</i> ₁₀	<i>P</i> ₂₀	<i>P</i> ₃₀	<i>P</i> ₄₀	<i>P</i> ₅₀ *	<i>P</i> ₈₀ †	<i>P</i> ₈₅	<i>P</i> ₉₅
0	26.9	44.6	74.0	115.8	177.3	270.9		912	1184
15.78						281.0			
20	29.6	50.0	80.2	123.9	187.8			926	1191
25							793		
30.44						290.0			
40	31.4	54.3	84.5	130.2	199.0			941	1206
50	32.3	56.4	86.3	132.6	196.3		816	948	1206
60	33.0	58.2	88.0	134.7	201.8			956	1213
61.31						302.3			
75.8							831		
80	34.5	61.3	90.0	137.6	205.5			964	1221
100	35.6	64.2	89.9	138.1	206.6	310.2		971	1235

* *P* in mm (± 0.1 %) (67, 68).

† (141).

B = C₆H₆.—(Continued)*P* and *p* at 34.8° (71); cf.
(57, 67, 141).49.99°, *p* in mm (± 1.5) (142); cf.
(93, 94)

100x _A	<i>p</i> _A	<i>p</i> _B
0	0	268.0
5.07	18.9	253.3
11.70	40.5	237.1
17.72	59.9	221.8
25.25	83.4	201.8
29.47	97.0	191.3
39.59	128.9	165.0
56.00	176.2	124.5
67.74	212.2	92.8
76.58	238.9	68.0
100	308.0	0

B = C₇H₈ Toluene (102)*P* in mm, also values at 10, 30,
40, 50, 60, 70, 75°B = C₇H₈.—(Continued)

100x _A	<i>P</i> ₀	<i>P</i> ₂₀	<i>P</i> ₅₀ *
0	9.9	26.5	93.0
3.99			99.0
10	12.8	33.5	
20	16.0	40.3	
24.01			140.8
40	24.0	51.9	
50	27.3	58.3	
51.42			197.7
60	29.0	66.1	
73.98			248.5
80	35.1	79.8	
90	38.6	86.2	
90.99			288.8
100	41.2	93.2	310.2

* *P* in mm (± 0.1 %) (67, 68).B = C₇H₈O, Cresol*P* at 0 and 20° (9)B = C₇H₈O Anisole*P* at 15° (135); at 0 and 20° (9)

CCl₄—(Continued)B = C₁₀H₁₁Cl1-Chlorotetrahydronaphthalene; *P* at 20° (123)B = C₁₀H₁₂Tetrahydronaphthalene (tetralin); *P* at 20° (137)**CO₂ (40)**B = CH₃Cl Methyl chlorideAt 9.5°, *P* (atm.) = 3.45*x_B* +44.3*x_A*

100 <i>x_A</i> in vapor	<i>P</i> (atm.)
100	3.45
80	4.75
60	6.1
50	7.2
40	9.2
30	12.8
20	19.2
10	30.0
0.0	44.3

B = C₃H₆O AcetoneSome approx. values of *P* at "freezing mixture" temperatures (40); at 6.8, 15.5, 25.5° (11).**CS₂**B = CHCl₃ Chloroform*P* at 0, 10, 20, 30, 40, 60, 80° (101, 102); at 13.8, 16.0° (37)B = CH₃O, *v. p.* 359B = C₂H₆O Ethyl alcohol (12, 13, 14)B = C₃H₆O Acetone*P* at 0, 10, 20, 30, 35° (102).

100 <i>x_A</i>	<i>p_A</i>	<i>p_B</i>
24.78°, <i>p</i> in mm (±0.5) (75)		
0	0	231.6
18.6	176.0	197.0
30.8	240.0	175.5
50.1	289.0	159.0
80.2	327.5	125.2
100	358.5	0

35.17°, *p** in mm (±1.1)(142); *cf.* (93, 94)

0	0	343.8
6.24	110.7	331.0
7.11	123.1	328.7
12.12	191.7	313.5
19.91	271.9	290.6
27.61	323.3	275.2
35.02	358.3	263.9
44.74	390.4	250.2
49.74	404.1	242.1
61.24	426.9	227.0
67.13	438.0	217.0
71.97	447.5	207.1
82.80	464.9	180.2
93.50	491.9	109.4
96.20	500.8	73.4
100	512.3	0

*For application of Duhem-Margules equation, *v.* (142); *cf.* (93, 94).B = C₃H₈O₂ Methylal

100 <i>x_A</i>	<i>p_A</i>	<i>p_B</i>
16.53°, <i>p</i> in mm (±0.5) (75)		
0	0	265.5
22.5	107.3	210.5
48.0	173.0	168.0
79.5	225.0	101.0
100	263.1	0

35.17°, *p* in mm (±1.1) (142);
cf. (93, 94)

0	0	587.7
4.89	54.5	558.3
10.30	109.3	529.1
16.40	159.5	500.4
27.10	234.8	451.2
34.70	277.6	419.0
39.01	297.8	402.7
45.36	324.8	378.0
49.46	340.2	360.8
53.93	357.2	342.2
60.71	381.9	313.3
68.27	407.0	277.8
73.77	424.3	250.1
79.50	442.6	217.4
84.45	458.1	184.9
91.08	481.8	124.2
95.54	501.0	65.1
100	514.5	0

B = C₄H₈O₂ *n*-Butyric acid
P at 20° (123)B = C₄H₁₀O Ethyl ether
20.0°, *p* in mm (±0.5) (36);
cf. (75)

100 <i>x_B</i>	<i>p_A</i>	<i>p_B</i>
0	298	0
5.1	284	41
15	265	101
25	243	150
40	208	213
50	182	250
65	144	299
80	88	357
90	45	401
100	0	441

B = C₆H₅NO₂ Nitrobenzene
P at 20° (124)B = C₆H₆
p in mm (±1) (100); *cf.* (12,
13, 14, 19, 36)

100 <i>x_B</i>	<i>p_A</i>	<i>p_B</i>
20°		
0	297.4	0
11.35	263.8	13.4
24.82	228.1	25.4
37.47	198.4	34.0
46.24	175.8	39.9
62.51	131.6	50.3
87.80	42.5	68.2
100	0	75.2

B = C₆H₆—(Continued)

100 <i>x_B</i>	<i>p_A</i>	<i>p_B</i>
25°		
0	361.1	0
2.11	352.7	3.5
4.68	344.1	7.1
11.53	321.4	16.0
18.24	299.1	24.0
30.02	263.6	35.1
49.86	197.4	53.7
63.02	156.6	63.5
76.63	102.5	75.3
87.14	60.2	83.8
94.19	27.9	89.5
100	0	94.9

30°

0	434.6	0
8.00	398.4	14.7
22.86	343.1	35.8
37.23	287.5	53.3
65.16	177.5	81.6
88.45	62.2	107.3
100	0	119.3

P at 0, 10, 20, 30, 40, 60, 80°
(102).B = C₇H₈ Toluene (101, 102)*P* at 0, 10, 20, 30, 40, 60, 80, 90,
100°B = C₇H₈O *m*-Cresol (136)*P* at 15°B = C₇H₈O Anisole (135)*P* at 15°**CHBr₃**

Bromoform

B = C₃H₆O Acetone (125)*P* at 20°B = C₃H₆O₂ Methyl acetate
(125)
P at 20°B = C₄H₁₀O Ethyl ether*P* at 20° (125); at 25.0, 75° (25)**CHCl₃**

Chloroform

B = C₃H₆O Acetone100*x_A* | *p_A* | *p_B*
35.17°, *p* in mm (±0.8) (142);
cf. (93, 94)

0	0	344.5
5.88	9.2	323.2
12.32	20.4	299.3
18.53	31.9	275.4
26.57	50.7	240.9
29.70	55.4	230.3
36.64	74.3	197.9
42.32	88.9	174.3
49.39	111.8	143.6
51.43	117.8	135.0
58.72	139.9	108.5
66.35	170.2	79.0
79.97	224.4	37.5
91.75	267.1	13.0
100	293.1	0

B = C₃H₆O—(Continued)

100 <i>x_B</i>	<i>p_A</i>	<i>p_B</i>
55.10°, <i>p</i> in mm (±0.5) (8)		
0	632.8	0
11.8	548.1	54.9
23.4	469.4	110.1
36.0	359.7	202.4
50.8	257.7	322.7
58.2	193.6	405.9
64.5	161.2	454.1
72.1	120.7	521.1
90	39.0	658.2
100	0	741.8

For 40.4 and 28.15°, *v.* (8).
P at 0, 10, 20, 30, 40, 50, 55°,
v. (101, 102).B = C₄H₈O₂ *n*-Butyric acid
P at 20° (123)B = C₄H₁₀O Ethyl ether
P in mm (102)*

100 <i>x_B</i>	<i>P₀</i>	<i>P₂₀</i>	<i>P_{33.25}</i> †
0	61	163	
5.0			276
8.0			276
10	70	178	
20	79	196	
20.3			282
29.5			294
40	100	240	
50	109	268	355
58.8			412
60	122	299	
69.5			500
80	151	364	
89.8			657
90	168	404	
95.5			697
100	187	443	731

17° (36)

100 <i>x_A</i>	<i>p_A</i>	<i>p_B</i>
0	0	397
10	6	354
20	13	304
30	22	251
40	34	196
50	50	143
60	71	95
70	91	60
80	111	32
90	129	14
100	143	0

* Also values at 10 and 30°.

† *P* in mm (±2) (8).B = C₆H₅NO₂ Nitrobenzene
P at 20° (124)B = C₆H₆ *P* in mm (101, 102)

100 <i>x_A</i>	<i>P₀</i>	<i>P₂₀</i>	<i>P₄₀</i>	<i>P₆₀</i>
0	26.9	77	185	394
10	30.9	87	201	425
20	33.4	96	216	459
30	36.8	104	232	493
40	40.8	112	249	533
50	44.2	120	266	567
60	47.4	128	289	602
70	51.2	137	307	638

B = C₆H₆.—(Continued)

100x _A	P ₀	P ₂₀	P ₄₀	P ₆₀
80	54.6	145	330	677
90	57.9	155	353	738
100	61.2	165	372	754

P at 80, 100° (101); at 10, 20, 30, 40, 50, 60° (102); at 34.8° (71); cf. (57, 67, 141); *P* and *p* at 20 and 90° (107.5).

B = C₆H₇N Aniline

P at 20° (132)

B = C₆H₁₀O Cyclohexanone

P at 20° (123, 133)

B = C₆H₁₂O Hexahydrophenol

P at 20° (127)

B = C₇H₈ Toluene

P and *p* at 34.8° (71); cf. (57, 67, 141)

B = C₇H₈O *m*-Cresol

P at 15° (136)

B = C₇H₁₄O Hexahydrocresols

P at 15° (136)

B = C₈H₁₁N Dimethylaniline

P at 20° (125, 132)

B = C₁₀H₁₁Cl 1-Chlorotetrahydronaphthalene

P at 20° (123)

B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)

P at 20° (125, 133)

CH₂O₂

Formic acid

B = C₃H₉N Trimethylamine (5)**B = C₆H₅N Pyridine (2, 3, 34)****B = C₆H₇N Picoline (34)****CH₃NO₂**

Nitromethane

B = C₂H₅I Ethyl iodide (39)

*P** in mm

100x _B	P ₆₀	P ₆₅
0	179	(222)
8.06	312	367
16.2	386	453
24.2	433	508
37.2	470	557
73.0	524	620
87.6	537	632
92.6	531	625
100	513	607

* Calc'd. values for *p_A* and *p_B* at 65° also given.

CH₄O

Methyl alcohol

B = C₂H₆O Ethyl alcohol (101)

At *t*°C, *P* (in mm) = *z*x_A + constant

<i>t</i> °	<i>z</i>	const.
20	50	44
40	119	135
60	244	357
80	450	813
100	763	1701

P at 0, 10, 20, 30, 40, 50, 60, 80, 100°, *v.* (102).

B = C₃H₈O *n*-Propyl alcohol

P in mm ± 1 (102)

100x _A	P ₀	P ₂₀
0	3.5	15.1
10	5.6	24.4
20	8.2	37.9
30	11.6	40.5
40	14.9	48.7
50	18.2	56.0
60	20.7	63.8
70	22.8	72.0
80	25.3	80.0
90	28.0	88.0
100	31.9	96.3

Values also given at 10, 30, 40, 50, 60°.

B = C₆H₅NO₂ Nitrobenzene

P at 20° (124)

B = C₆H₆, *v. infra***B = C₆H₇N Aniline**

P at 20° (132)

B = C₆H₁₂O Hexahydrophenol

P at 20° (127, 128)

B = C₆H₁₄, *v. infra***B = C₇H₆O Benzaldehyde**

P at 20° (130)

B = C₇H₈O *m*-Cresol

P at 15° (136)

B = C₇H₁₄O Hexahydrocresols

P at 20° (130)

B = C₈H₁₁N Dimethylaniline

P at 20° (132)

C₂HCl₃

Trichloroethylene

B = C₆H₁₀O Cyclohexanone

P at 20° (131)

B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)

P at 20° (137)

A = CH₄O; B = C₆H₆; *P in mm (101, 102)**

100x _A	P ₀	P ₂₀	P ₄₀	P ₆₀	P ₈₀	P ₁₀₀
0	26.9	77	186	394	755	1344
10	36.4	107	266	622	1208	2150
20	44.1	128	329	742	1472	2658
30	48.5	140	356	802	1581	2845
40	48.8	144	362	811	1611	2875
50	49.1	146	365	816	1627	2889
60	49.2	145	367	827	1631	2894
70	48.6	145	363	824	1622	2884
80	48.3	142	348	782	1581	2837
90	44.2	123	309	718	1490	2723
100	31.9	94	254	601	1263	2464

P at 10, 20, 30, 40, 60, 80, 100°, *v.* (102).

* Error: 20, 40°, ± 2%; 60°, -4 to 1.7%; 80, 100°, 0 to -6%.

C₂HCl₅

Pentachloroethane

B = C₃H₆O Acetone

P at 20° (134)

B = C₃H₆O₂ Methyl acetate

P at 20° (134)

B = C₄H₈O₂ Ethyl acetate

P at 20° (134)

B = C₄H₁₀O Ethyl ether

P at 20° (134)

B = C₆H₆; *P* at 20° (134)**C₂H₃N**

Methyl cyanide

B = C₂H₆O Ethyl alcohol (116)**C₂H₄**

Ethylene

B = C₂H₆O Methyl ether (11)

P at 33, 40, 54.5, 76° (approx.)

C₂H₄Br₂

Ethylene bromide

B = C₃H₆Br₂ 1, 2-Dibromopropane (142); cf. (93, 94)

85.05°, *p* in mm (± 1.5)

100x _B	<i>p_A</i>	<i>p_B</i>
0	172.6	0
2.02	167.8	3.2
14.75	145.1	19.9
30.48	120.8	38.1
41.80	100.5	52.9
62.03	64.0	79.3
80.05	34.3	102.5
91.48	13.8	117.1
96.41	4.6	123.8
100	0	127.2

C₂H₄Cl₂

Ethylene chloride

B = C₆H₆ (108, 142); cf. (93, 94)

Ideal over 9 to 95°

C₂H₄Cl₂

1, 1-Dichloroethane

B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)

P at 20° (137)

C₂H₄O

Acetaldehyde

B = C₂H₆O Ethyl alcohol

P in mm (109)*

100x _A	<i>t</i> °	<i>P</i>
15.5	25	34
54.5	25	398
82	25	699
30	40	398
48	40	699
16.5	60	699
2.5	60	398

* *q. v.* for additional data.

C₂H₄O₂

Acetic acid

B = C₃H₉N Trimethylamine (5)**B = C₄H₈O₂ Butyric acid (55, 56)**

P of equimol. mixtures, 13–52°

B = C₅H₅N Pyridine (2, 3, 34, 142); cf. (93, 94)

P and *p* at 80.05°

B = C₆H₆ (142); cf. (93, 94)*

100x _A	<i>p_A</i>	<i>p_B</i>
49.99°	<i>p</i> in mm (± ca. 1.0)	
1.60	3.63	262.9
4.39	7.25	257.2
8.35	11.51	249.6
11.38	14.2	244.8
17.14	18.4	231.8
29.79	24.8	211.2
36.96	28.7	195.6
58.34	36.3	153.2
66.04	40.2	135.1
84.35	50.7	75.3
99.31	54.7	3.5

For *P* at 10, 20, 30, 40, 50, 60, 70°, *v.* (102). For *P* and *p* at 20, 35°, *v.* (71); cf. (57, 67, 141).

* *q. v.* for *x_A* in gas phase; for application of Duhem-Margules equation.

B = C₆H₁₅N Triethylamine (34)**A = CH₄O; B = C₆H₁₄ Hexane; *P* in mm (± 1.5) (104)**

100x _B	0	6.84	9.21	14.37	42.3	51.0	64.0	100
<i>P</i> _{43.8} *	306	509	529	539	556	547	550	309

* Slightly above critical soln. temp.

C₂H₄O₂—(Continued)B = C₇H₈ Toluene (142); cf. (93, 94)*69.94°, *p* in mm (± ca. 1.0)

100 <i>x</i> _A	<i>p</i> _A	<i>p</i> _B
4.35	17.2	193.5
9.42	30.5	186.1
17.11	46.5	176.2
24.03	57.8	167.3
23.80	69.3	155.7
40.88	78.2	154.2
46.51	83.7	137.6
51.40	88.2	130.7
59.81	95.7	117.8
68.79	103.0	101.9
76.90	110.8	84.8
87.50	120.5	54.8

At 35° (71); cf. (57, 67, 141).

* *q. v.* for *x*_A in gas phase.**C₂H₅Br**

Ethyl bromide

B = C₂H₅I Ethyl iodide (37, 140)*P* at 16.7° approx. linear function of *x***C₂H₅I**

Ethyl iodide

B = C₄H₈O₂ Ethyl acetate (142); cf. (93, 94)49.99°, *p* in mm (± 0.8)

100 <i>x</i> _A	<i>p</i> _A	<i>p</i> _B
0	0	280.4
5.79	28.0	266.1
10.95	52.7	252.3
19.18	87.7	231.4
23.53	105.4	220.8
37.18	155.4	187.9
54.78	213.3	144.2
63.49	239.1	122.9
82.53	296.9	66.6
90.93	322.5	38.2
100	353.4	0

B = C₆H₁₄ *n*-Hexane (39)*P** in mm

100 <i>x</i> _A	<i>P</i> ₆₀	<i>P</i> ₆₅
0	(571)	670
4.75		693
23.6	629	741
38.2	640	749
48.1	638	749
66.6	623	733
72.7	613	721
84.2	582	684
94.1	541	636
100	513	607

* *p*_A and *p*_B at 65°, calc'd. from Duhem-Margules equation also given.**C₂H₆O**

Ethyl alcohol

B = C₃H₈O *n*-Propyl alcohol (29)

Ideal (± 0.5mm) at 25°

B = C₃H₈O₃ Glycerol*v. p.* 360B = C₄H₁₀O Ethyl ether*P* in mm (80)* *v. also p.* 361

Wt. % B	19°	18°	10°	0°	−18°
10	115			54	
20	160			74	28
40		238	171	104	
60				132	50
80		347		157	63

* Composition of gas phase (very inaccurate) also given.

B = C₆H₅NO₂ Nitrobenzene (88)*P* at 20, 30, 40, 50, 60°B = C₆H₆, *v. p.* 360B = C₆H₁₀O Cyclohexanone
P at 20° (133)B = C₇H₆O₂ *o*-Salicylaldehyde
P at 20° (122)B = C₇H₈ Toluene (67, 68)

100 <i>x</i> _A	<i>P</i> in mm (± 0.1%)
0	93.0
4.20	141.2
17.75	214.8
30.89	233.1
46.13	242.1
57.65	244.2
66.80	249.2
76.27	248.2
83.69	244.4
88.02	243.0
95.99	230.9
100	219.5

B = C₇H₈O Cresol (9); cf. (126, 128)*p* in mm (techn. B. P. 196 to 201°)

Wt. % A	<i>p</i> _A	Wt. % A	<i>p</i> _A
0°C		20°C	
11.1	0.62	1.45	0.21
14.7	1.03	6.08	1.23
22.5	1.59	13.95	3.30
31.9	2.40	24.8	6.92
		31.7	9.15

B = C₇H₈O Anisole (9)
p at 0, 20°B = C₁₀H₁₁Cl 1-Chlorotetrahydronaphthalene
P at 20° (123)B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)
P at 20° (133)B = C₁₀H₁₂O *ar*-Tetrahydro-β-naphthol
P at 15° (133)**C₃H₅N₃O₉**

Trinitroglycerol

B = C₃H₆O Acetone (74)*v. also p.* 30018°, *p* in mm

Wt. % B	<i>p</i> _B	10 ⁶ <i>p</i> _A
0	0	
10	30	135
20	54	89
30	76	
40	95	35
50	112	20
60	129	
70	142	6
80	150	
90	157	
100	162	0

C₃H₆O

Acetone

B = C₃H₈O Isopropyl alcohol (145)B = C₄H₈O Ethyl methyl ketone
P in mm (88, 89)

100 <i>x</i> _A	<i>P</i> ₂₀	<i>P</i> ₃₀	<i>P</i> ₄₀	<i>P</i> ₅₀
0	77	121	188	300
20	116	168	246	358
30	126	184	269	390
40	138	201	294	421
60	158	234	338	485
70	163	247	359	517
80	168	257	381	553
100	186	285	425	621

B = C₄H₈O₂ *n*-Butyric acid
P at 20° (123)B = C₄H₁₀O Ethyl ether
P in mm 0.0° (22)

100 <i>x</i> _A		<i>P</i>
Liq.	Vap.	
0	0	70
15.6	44.6	119
19.2	43.6	117
36.4	61.7	142
51	67	150
61.7	72.8	167
83.5	86.1	181
100	100	185

p in mm (± 1) (100); cf. (106, 107.5)

100 <i>x</i> _A	<i>p</i> _A	<i>p</i> _B
	20.00°	
0	0	444
5.20	20	422
12.71	42	394
24.90	70	350
45.7	105	282
61.2	127	224
66.6	135	199
84.2	160	111
93.6	175	46
97.9	181	15
99.6	184	2
100	185	0

B = C₄H₁₀O—(Continued)100*x*_A | *p*_A | *p*_B
30.00°

0	0	646
3.87	22	632
13.27	66	571
25.1	107	510
34.5	132	464
49.6	167	390
65.1	214	266
83.8	243	166
93.4	267	71
95.3	271	55
98.0	276	21
100	283	0

B = C₆H₅NO₂ Nitrobenzene
P at 20° (124)B = C₆H₇N Aniline
P at 20° (125, 132)B = C₆H₁₀O Cyclohexanone
P at 20° (133)B = C₆H₁₂O Hexahydrophenol
P at 20° (127, 128)B = C₇H₆O₂ *o*-Salicylaldehyde
P at 20° (122)B = C₇H₈ Toluene (92, 93)
Comp. of vapor phaseB = C₇H₈O Cresol (9); cf. (126, 129)

Techn. B. P. 196–201°

Wt. % A	<i>p</i> _A in mm	
	0°	20°
6.7	0.76	2.39
8.3	1.20	3.31
14.8	2.71	7.56
22.4	5.30	15.45

B = C₇H₈O Anisole
p at 0, 20° (9)B = C₈H₁₁N Dimethylaniline
p at 15° (135); *P* at 20° (132)B = C₁₀H₁₁Cl 1-Chlorotetrahydronaphthalene
P at 20° (123)B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)
P at 20° (133)B = C₁₀H₁₂O *ar*-Tetrahydro-β-naphthol
P at 15° (133)**C₃H₆O₂**

Propionic acid

B = C₅H₅N Pyridine (2, 3, 34)**C₃H₆O₂**

Methyl acetate

B = C₄H₈O₂ *n*-Butyric acid
P at 20° (123)B = C₄H₈O₂ Ethyl acetate
P in mm (± 1) (102)

100 <i>x</i> _B	<i>P</i> ₀	<i>P</i> ₂₀
0	25.2	83.3
10	28.8	92.5
20	32.7	103.1

B = C₄H₈O₂—(Continued)

100x _B	P ₀	P ₂₀
30	37.9	112.5
40	41.1	122.8
50	44.2	132
60	47.9	141
70	51.8	150
80	56.0	159
90	60.8	166
100	65.0	172.5

Values also given for *P* at 10, 30, 40, 50, 60, 80, 100°.

B = C₆H₆, *P* in mm (101)

100x _A	P ₀	P ₂₀	P ₄₀	P ₆₀
0	26.9	77	185	394
10	32.3	94	228	473
20	40.2	107	262	542
30	46.8	122	290	606
40	50.4	134	312	662
50	54.1	144	335	713
60	57.2	154	356	752
70	58.2	162	375	787
80	60.5	166	388	814
90	61.9	168	400	840
100	64.1	171	407	854

P at 10, 20, 30, 40, 50, 60, 70, 80, 90, 100° (101, 102).

**B = C₆H₇N Aniline
P at 20° (132)****B = C₈H₁₁N Dimethylaniline
P at 20° (132)****B = C₁₀H₁₁Cl 1-Chlorotetrahydronaphthalene
P at 20° (123)****C₃H₈O****Propyl alcohol****B = C₆H₆ (102) *P* at 0, 10, 20, 30, 40, 50, 60, 70°****C₄H₈O₂*****n*-Butyric acid****B = C₆H₆, *P* at 20° (123)****C₄H₈O₂****Ethyl acetate****B = C₄H₁₀O Ethyl ether (102)**

P at 10, 30, 40, 50°; *P*₀ and *P*₂₀ (±1 mm); almost linear

**B = C₆H₅NO₂ Nitrobenzene
P at 20° (124)****B = C₆H₆, *P* in mm ± 1 (102)**

100x _A	P ₀	P ₂₀
0	26.9	76.9
10	26.9	86.3
20	27.0	95.8
30	27.0	103.4
40	27.1	106.5
50	27.2	107.3
60	27.1	104.6
70	26.9	101.3
80	26.5	94.3
90	26.0	83.4
100	24.6	73.8

Also values at 10, 30, 40, 50, 60°.

**B = C₆H₁₀O Cyclohexanone
P at 20° (130)****B = C₆H₁₂O Hexahydrophenol
P at 20° (127, 128)****B = C₆H₁₂O₂ Propyl propionate (141)**

100x _B	p ₈₅ (mm)
0	968
25	857
50	733
74.6	610
100	480

**B = C₇H₈O *m*-Cresol
P at 15° (136)****B = C₇H₁₄O Hexahydrocresols
P at 15° (136)****B = C₇H₁₄O₂ Amyl acetate
P in mm ± 1 mm (102)**

100x _A	P ₀	P ₂₀
0	1.0	6.5
10	5.1	14.0
20	8.2	20.8
30	10.9	29.0
40	12.6	36.3
50	14.8	43.7
60	18.1	50.2
70	20.2	57.1
80	22.0	63.5
90	25.1	69.9
100	27.2	76.5

Also values at 10, 20, 30, 40, 50, 60, 70°.

**B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)
P at 20° (137)****C₄H₁₀****Butane****B = C₅H₁₂ Pentane (16)
P and *p* at 25°****B = C₆H₆; *P* and *p* at 25° (16)****B = C₇H₁₆ *n*-Heptane (16)
P and *p* at 25°****C₄H₁₀O****Ethyl ether****B = C₆H₅NO₂ Nitrobenzene
P at 16° (90); cf. (71); at 20° (124)****B = C₆H₆ (101)**

At *t*°C, *P* (in mm) = *zx*_B + constant

<i>t</i> °	<i>z</i>	const.
20	358	76.5
40	726.5	185.5
60	1326	395
70	1758	551.5

**B = C₇H₆O₂ Salicylaldehyde
P at 20° (122)****B = C₇H₈O Cresol**

p in mm (9); cf. (126, 129)

Techn. B. P. 196–201°

Wt. % A	p _A	Wt. % A	p _A
A	0°	A	20°
2.31	0.61	0.53	0.37
5.86	1.62	5.52	4.18
10.8	3.33	7.00	6.08
14.5	5.22	9.9	10.4
		11.4	13.3

**B = C₇H₈O Anisole (9)
p at 0, 20°****B = C₈H₈O₃ Methyl salicylate
16° (90); cf. (71)****B = C₉H₁₀O₂ Ethyl benzoate
P at 16° (90); cf. (71)****B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)
P at 20° (133)****B = C₁₀H₁₆ Turpentine
16° (90); cf. (71)****C₅H₁₂****Pentane****B = C₇H₁₆ *n*-Heptane (16)
P and *p* at 25°****C₆H₅Br****Bromobenzene****B = C₆H₅Cl Chlorobenzene
Ideal at 140° (140)****B = C₆H₆ (71); cf. (57, 67, 141)
P and *p* at 34.8°****C₆H₅NO₂****Nitrobenzene****B = C₆H₆; *P* at 20° (124)****C₆H₆****B = C₆H₇N Aniline (132)
P at 20°****B = C₆H₁₀O Cyclohexanone
P at 20° (133)****B = C₆H₁₂O Hexahydrophenol
P at 20° (127)****B = C₇H₆O₂ Salicylaldehyde
P at 20° (122)****B = C₇H₈ Toluene (101); cf. (73, 102)**

100x _A	P ₀	P ₂₀	P ₄₀
0	9.7	24	64
10	10.4	30	78
20	12.2	36	94
30	14.0	42	109
40	15.6	47	122
50	17.7	51	136
60	19.6	56	148
70	21.8	62	158
80	23.7	68	168
90	25.8	74	178
100	26.9	76	186

60–120°, ideal.

B = C₇H₈O Cresol

p in mm (9); cf. (126)

Techn. B. P. 196–201°

Wt. % A	p _A	Wt. % A	p _A
A	0°	A	20°
1.15	0.85	1.70	3.82
6.40	4.75	3.00	6.93
9.20	7.00	3.58	8.05
12.4	9.84	4.60	10.30
		7.30	15.20

**B = C₇H₈O Anisole
P at 0 and 20° (9)****B = C₇H₁₄O Hexahydrocresols
P at 20° (127, 128)****B = C₈H₁₁N Dimethylaniline
P at 20° (132)****B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)
P at 20° (133)****C₆H₆O****Phenol****B = C₇H₈O Cresol, ideal (23)****C₆H₁₂****Cyclohexane****B = C₁₁H₂₀ 1-Methyldecahydronaphthalene
P at 20° (123)****B = C₁₁H₂₀ 2-Methyldecahydronaphthalene
P at 20° (123)****B = C₁₂H₂₂ 1, 6-Dimethyldecahydronaphthalene
P at 20° (123)****B = C₁₂H₂₂ 2, 6-Dimethyldecahydronaphthalene
P at 20° (123)****C₆H₁₄****Hexane****B = C₈H₁₈ Octane (141)**

100x _B	P ₈₀ (mm)
0	1062
23	861
50	618
75	330
100	174.8

**B = C₁₀H₁₂ Tetrahydronaphthalene (tetralin)
P at 20° (133)****C₇H₈****Toluene****B = C₇H₈O *m*-Cresol
P at 15° (136)****B = C₈H₁₀ Ethylbenzene (141)**

100x _B	P ₁₁₈ (mm)
0	965
25	813
50	692
75	565
100	456.6

C₇H₁₂

Methylcyclohexene (Mix.)

B = C₁₁H₂₀ 1-Methyldecahydronaphthalene
P at 20° (123)B = C₁₁H₂₀ 2-Methyldecahydronaphthalene
P at 20° (123)B = C₁₂H₂₂ 1, 6-Dimethyldecahydronaphthalene
P at 20° (123)B = C₁₂H₂₂ 2, 6-Dimethyldecahydronaphthalene
P at 20° (123)**C₇H₁₄**

Methylcyclohexane

B = C₁₁H₂₀ 1-Methyldecahydronaphthalene
P at 20° (123)B = C₁₁H₂₀ 2-Methyldecahydronaphthalene
P at 20° (123)**(b) Aqueous Systems**

B = HCl, v. p. 258, 293, 301, 361

B = HBr, v. p. 258, 306, 361

B = HI, v. p. 258, 306

B = SO₂, v. p. 258, 302, 361B = H₂SO₄, v. p. 293, 302B = NH₃ (138); cf. (144)

The total vapor pressure for any composition and for any temperature between 0 and 90°C may be computed with the aid of the empirical equations

$$\theta = \frac{T}{1 + 0.703_6(1 - x_B^2)}$$

and

$$z = (x_B + 0.05)\frac{1}{2} (1.34_7 - 2.9x_B + 1.77x_B^2)$$

B = CH₂O Formaldehyde (64)p_B in mm

Wt. %B	1	5	10	15	20	25	30	35
0		(0.037)	0.070	0.098	0.120	0.141	0.162	
20		(0.18)	0.351	0.487	0.600	0.714	(0.83)	
35	(0.13)	0.605	1.150	1.58	1.96	2.28	2.575	2.85
45		(1.20)	2.21	3.11	3.89	4.56	5.14	5.72

B = CH₂O₂ Formic acid, v. p. 364B = CH₄O Methyl alcohol (119)
p in mm (± ca. 0.9)

100x _B	p _A	p _B
	39.9°	
0	54.7	0
14.99	39.2	66.1
17.85	38.5	75.5
21.07	37.2	85.2
27.31	35.8	100.6
31.06	34.9	108.8
40.1	32.8	127.7

B = C₁₂H₂₂ 1, 6-Dimethyldecahydronaphthalene
P at 20° (123)B = C₁₂H₂₂ 2, 6-Dimethyldecahydronaphthalene
P at 20° (123)**C₈H₁₆**

1, 3-Dimethylcyclohexane

B = C₁₁H₂₀ 2-Methyldecahydronaphthalene
P at 20° (123)B = C₁₁H₂₀ 1-Methyldecahydronaphthalene
P at 20° (123)B = C₁₂H₂₂ 1, 6-Dimethyldecahydronaphthalene
P at 20° (123)B = C₁₂H₂₂ 2, 6-Dimethyldecahydronaphthalene
P at 20° (123)

in which *T* is the absolute temperature of the solution of composition 100x_B mole % NH₃, and *θ* is the absolute temperature at which pure liquid NH₃ (*q. v.*) has the same vapor pressure as the solution.

The partial vapor pressure of H₂O (0–90°) may be computed from the empirical relations:

$$p_A = (1 - \alpha)x_A p_0$$

$$\alpha = 0.1x_B \text{ for } x_B < 0.53$$

$$\alpha = 0.055x_B \text{ for } x_B > 0.53$$

p₀ = the vapor pressure of pure H₂O at the same temperature. v. also p. 259 and 362.

B = HNO₃, v. p. 304 and 309B = H₃PO₄, v. p. 293

B = HCN, v. p. 261 and 365

B = CH₄O.—(Continued)

100x _B	p _A	p _B
47.08	84.8	335.6
55.5	76.9	373.7
69.2	57.8	439.4
78.5	43.8	486.6
85.9	30.1	526.9
100	0	609.3

B = C₂H₄O₂ Acetic acid
v. p. 306

B = C₂H₆O Ethyl alcohol (23, 31, 119, 139); cf. (57, 60)
Log p_A or log p_B for any given composition is a linear function of $\frac{1}{t + 273.1}$ between any two values in the following table.

Wt. % B	p _A	p _B
	20°	
0	17.5	0.0
10	16.8	(6.7)
20	15.9	(12.6)
30	15.1	(17.1)
40	14.7	20.7
50	14.5	23.5
60	14.1	25.6
70	13.1	28.0
80	11.3	31.2
90	7.5	35.8
98	1.9	42.3
100	0.0	43.6
	40°	
0	54.3	0.0
10	51.6	26.9
20	47.6	43.5
30	46.2	54.7
40	45.5	62.5
50	44.6	68.2
60	42.9	74.8
70	40.5	82.8
80	35.9	91.8
90	24.7	106.4
98	6.5	123.0
100	0.0	134
	55°	
0	117	0.0
10	110.7	59.3
20	104.0	94.4
30	100.5	114.8
40	98.8	130.8
50	97.3	142.6
60	94.4	155.6
70	89.1	172.6
80	77.6	192.8
90	52.5	223.9
98	14.3	262.4
100	0.0	283
	75°	
0	287	0
10	276	144.0
20	261	218.8
30	254	269.2
40	245	305
50	241	336
60	235	365
70	224	405

B = C₂H₆O.—(Continued)

Wt. % B	p _A	p _B
80	191.4	454
90	130.3	527
98	34.7	625
100	0.0	667

B = C₃H₆O Acetone (110);
cf. (103)

p in mm (± 4)

100x _B	25°	30°	45°	60°
	p _A *			
0.0	23	31	71	149
3.33	27	34	76	149
7.20	27	34	70	143
11.7	25	30	66	134
17.1	24	34	71	145
23.6	22	29	62	129
31.8	28	35	67	126
42.0	23	29	59	116
55.4	16	20	47	102
73.7	17	21	45	97
100	0	0	0	0

	p _B *			
0.0	0	0	0	0
3.33	38	47	101	190
7.20	77	96	192	342
11.7	105	134	253	443
17.1	125	157	293	495
23.6	146	182	329	553
31.8	152	189	346	588
42.0	164	205	369	624
55.4	182	225	400	672
73.7	192	236	423	711
100	229	281	505	860

* For data at 35, 40, 50, 55°, v. (110).

B = C₃H₆O₂ Propionic acid
P in mm (± 2) (60)

100x _B	7.48	19.1	43.2
P ₂₀	18	17	16
P ₄₀	52	51	47
P ₆₀	147	143	130
P ₈₀	353	355	315
P ₁₀₀	765	750	687

For additional data, see (60).

B = C₃H₆O₂ Methyl acetate
56.9°, p in mm (74); cf. (143)
v. also p. 364, 365

100x _B	p _A	p _B
65*	121	633
75	111	654
85	96	678
90	78	698
100	0	760

* Saturated solution.

B = C₃H₈O *n*-Propyl alcohol
(119); cf. (57, 60)
v. also p. 365

100x _B	p _A	p _B
	p in mm (± 1)	
	30.3°	
0	32.2	0
8.66	29.3	16.3
15.77	29.8	17.2
39.02	28.5	18.5

B = C₃H₈O.—(Continued)100x_B | p_A | p_B
30.3°.—(Continued)

55.5	27.2	19.8
100	0	28.5
49.9°		
0	92.0	0
9.04	87.2	49.2
15.97	87.0	51.7
30.47	84.5	54.6
41.14	83.0	57.4
55.5	78.2	60.2
73.9	60.9	68.4
82.0	49.2	72.1
100	0	90.0
65.9°		
0	195.6	0
8.87	187.2	105.5
15.81	187.6	108.5
30.28	180.1	119.1
47.82	171.3	128.7
55.5	162.3	135.1
73.9	124.7	153.1
82.0	99.0	162.2
100	0	198.8
79.8°		
0	352.6	0
8.56	342.3	187.7
15.58	339.7	199.9
30.12	324.9	222.1
47.82	306.9	238.8
55.5	290.3	251.4
73.9	218.4	288.2
82.0	171.2	308.0
100	0	374.6

B = C₃H₈O₃ Glycerol
P in mm, at 25° (27); at 100° (35); v. also p. 310

Wt. % B	P ₂₅	Wt. % B	P ₁₀₀
0	23.7	0	760
15.5	23.0	10	740
25	22.0	25	704
35	20.2	40	657
50	17.4	65	553
60	14.8	75	450
75	10.5	80	396
83	8.0	85	326
92	4.0	90	247
98	0.4	98	107
		100	64

B = C₆H₅NO₂ Nitrobenzene (18)

t°	Wt. % A	Wt. % A (vap.)	10 ⁴ Wt. A/cm ³ (vap.)	10 ⁴ Wt. B/cm ³ (vap.)
175.1	5.60	57.87	44.54	32.43
188.6	6.95*	58.64	54.31	38.31
212.0	10.10	60.05	88.65	58.98
228.1	16.00	65.37	117.7	62.35
233.2	82.30	77.90	146.4	41.71
224.8	87.00	81.70	133.2	29.66
172.7	96.2	89.70	66.11	73.00

* P = 11.43 atm. (calc'd.).

B = C₄H₈O Methyl ethyl ketone

73.6°, p in mm (74)

100x _B	p _A	p _B
58.72*	263	495
65	259	501
70	252	508
80	216	532
90	146	568
100	0	619

* Saturated solution.

B = C₄H₈O₂ n-Butyric acid

P in mm (30)

100x _B	P ₀	P _{18.2}	P _{58.7}
0	4.57	15.67	140.6
9.6	4.18	14.10	140.9
23.4	3.79	12.42	134.9
38.0	2.96	10.24	123.2
52.6	2.26	9.2	
100	(0.12)	0.7	(9.5)

P in mm (±2) (60)

100x _B	6.67	17.3	32.9
P ₂₀	18	19	17
P ₄₀	49	55	46
P ₆₀	155	150	145
P ₈₀	360	356	346
P ₁₀₀	775	762	741

For additional data, v. (60).

37.5 Wt. % soln.	t°	P (mm)
Isobutyric acid (27)	23.02	21.6
	29.02	30.6

B = C₄H₁₀O Isobutyl alcohol
v. p. 365**B = C₅H₅N Pyridine (142);**
cf. (93, 94)

80.05°, p in mm

100x _A	p _A	p _B
0	0	239
10	109	201
25	201	163
58	308	124
78	333	107
89	335	103
95	336	93
100	355	0

B = C₅H₈O₂ Acetylacetone
v. p. 365**B = C₆H₆O Phenol**

P in mm (±1) (104); v. also p. 365

100x _B	0	2.51	4.70	7.74	14.97	31.65	44.8	85.6
P ₆₉ *	223.8	233.7	224.2	224	222	224	211.3	175

* Slightly > crit. soln. temp.

P in mm (65)

100x _B	P ₇₅	P ₇₇	P ₇₉	P ₈₁	P ₈₃	P ₈₅
0	289	314	340	369	400	433
1	293	318	344	373	403	436
2	294	319	345	374	405	438
4	294	319	345	374	405	438
17	294	319	345	374	404	438
39	268	289	310	336	364	397
50	201	223	245	267	290	311

B = C₇H₇NO₂ o-Nitrotoluene (18)

t°	Wt. % A	Wt. % A (vap.)	10 ⁴ Wt. A/cm ³ (vap.)	10 ⁴ Wt. B/cm ³ (vap.)
183.9	5.20	62.97	56.07	32.97
237.0	15.5	66.59	143.8	72.15
252.2	83.0	78.71	200.0	54.09
230.0	92.1	79.06	147.7	38.69
194.3	96.2	88.26	80.08	10.61

II. THREE-COMPONENT SYSTEMS**H₂O****B = CH₃O (60); cf. (57)**

Methyl alcohol

C = various salts

B = C₂H₆O Ethyl alcohol
20° (139)C = C₃H₈O₃ Glycerol

5 g-mol C/1000g (A + B)

100x _B	p _A	p _B
0	15.5	0
16.3	13.5	18.1
27.7	12.6	23.0
42.5	10.9	26.8
70.0	7.2	31.5
90.4	3.5	35.9
98.0		38.3

Wt. % A = 62, Wt. % B = 38

C Mol/l.	0	0.263
p _A (mm)	17.2	16.3
p _B (mm)	20.2	21.1

C = C₄H₁₀O Ethyl ether, v. p. 377**C = (a) C₇H₆O₂ Benzoic acid**
(b) C₇H₆O₃ Salicylic acid
1 g-mol C/1000g equimol. mixture (A + B), p in mm (±5%)

C	None	C ₇ H ₆ O ₂	C ₇ H ₆ O ₃
p _A	13.7	13.9	14.4
p _B	27.9	25.6	26.0

C = C₇H₈O Benzyl alcohol
Mol C/1000g equimol. mixture (A + B), p in mm (±5%)

Mol C	p _A	p _B
0	13.6	27.9
1	14.0	25.8
3	14.3	22.2
6	14.1	19.7
10	14.1	17.8

C = C₇H₈O.—(Continued)

1 g-mol C/1000g equimol. mixture (A + B)

Mol C	None	1 g-mol
p _A	13.7	14.0
p _B	27.9	25.8

Mol C/1000g (A + 20 Mol % B)

Mol C	p _A	p _B
0	16.9	20.0
0.5	15.9	18.1
1	15.3	17.0
2	16.3	15.4
3	16.9	13.8

Wt. % A = 62, Wt. % B = 38,
p in mm

Mol/l C	0	0.048
p _A	17.2	14.0
p _B	20.2	16.6

C = (a) C₇H₉N p-Toluidine
(b) C₈H₈O₂ Phenylacetic acid
(c) C₈H₉NO Acetanilide
(d) C₈H₁₀O Phenylethyl alcohol
(e) C₁₂H₁₆O₂ Amyl benzoate

1 g-mol C/1000g equimol. mixture (A + B) p in mm (±5%)

C	p _A	p _B
None	13.7	27.9
(a)	14.2	25.0
(b)	13.9	26.0
(c)	14.0	25.3
(d)	13.9	25.9
(e)	14.5	26.5

B = C₂H₆O.—(Continued)
 C = C₁₂H₂₂O₁₁ Sucrose
 Wt. % A = 62, Wt. % B = 38,
 p in mm

Mol/l C	0	0.072
<i>p</i> _A	17.2	14.6
<i>p</i> _B	20.2	21.3

B = C₃H₆O₂ Methyl acetate
 C = C₁₂H₂₂O₁₁ Sucrose (143)

B = C₆H₆O Phenol
 C = C₆H₇N Aniline, v. p. 379

CCl₄

B = C₂H₄Br₂ Compn. of the
 vapor phase

C = C₇H₈ Toluene (97)

B = C₂H₆O Ethyl alcohol
 C = C₆H₆ Benzene, v. p. 375

CS₂

B = C₃H₆O Acetone (75)

C = C₆H₃N₃O₇ Picric acid
 v. p. 375

C = C₈H₉NO Acetanilide (75)
 v. p. 375

B = C₃H₈O₂ Methylal (75)

C = C₆H₃N₃O₇ Picric acid
 v. p. 375

C = C₁₀H₈ Naphthalene (75)
 v. p. 375

B = C₄H₁₀O Ethyl ether
 C = C₆H₃N₃O₇ Picric acid
 v. p. 375

C = C₁₀H₈ Naphthalene
 v. p. 375

C = C₁₀H₁₆O Camphor
 v. p. 375

CHCl₃

Chloroform

B = C₄H₁₀O Ethyl ether
 C = C₆H₃N₃O₇ Picric acid
 v. p. 375

C = C₈H₉NO Acetanilide
 v. p. 375

C = C₁₀H₈ Naphthalene
 v. p. 375

C₂H₄O₂ (55, 56)

Acetic acid

B = C₄H₈O₂ Butyric acid
 C = C₅H₁₀O₂ Valeric acid

C = C₁₀H₂₀O₂ Capric acid

LITERATURE

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TWO-PHASE LIQUID—VAPOR ISOTHERMAL SYSTEMS, VAPOR-PRESSURE LOWERING*

J. C. W. FRAZER, R. K. TAYLOR AND A. GROLLMAN

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p = partial vapor pressure of the solvent from the solution.

*p*₀ = its vapor pressure in the pure state at the same temperature.

For values of *p*₀ consult the section on vapor pressures of pure liquids, p. 201, 202, 213.

* See also "Partial Vapor Pressures" p. 284, and "P-T-X Relations" p. 351.

AQUEOUS SOLUTIONS

(Standard arrangement, v. p. viii)

The quantities appearing in the tables are *M*, the number of gram-formula weights of solute per 1000 g H₂O, and 100*R* = $\frac{100(p_0 - p)}{Mp_0}$. Within the accuracy of the data, the relation between *M* and 100*R* is linear between values marked with an arrow, thus $\begin{matrix} 0.1 \\ \downarrow \\ 2.2 \end{matrix}$.

Two-Component Systems

Two-Component Systems											
HCl		M | 100R 100° (48)		M | 100R 90°		$C_4H_6O_4$ Succinic acid M | 100R 100° (48)		M | 100R 30°		M | 100R 100° (48)	
24.95° (24)		1.5 | 3.00		1.2 | 3.15		1.2 | 1.61		2.0 | 1.97		1.6 | 1.58	
0.05	2.80	3.0 | 2.98		2.3 | 3.14		2.8 | 1.616		2.5 | 2.01		3.7 | 1.505	
0.10	3.00	6.0 | 2.92		3.0 | 3.15		4.0 | 1.595		3.0 | 2.04		7.5 | 1.527	
0.20	3.20					4.7 | 1.562		3.5 | 2.06			
0.4	3.42					8.0 | 1.546		4.0 | 2.08			
0.6	3.56							4.5 | 2.09			
1.5	4.13							5.5 | 2.12			
3.6	5.63										
H_2SO_4 25° (19)		NH_4Br <i>v. also</i> p. 363 40-95° (47, 48)		$C_4H_6O_6$ <i>d</i> -Tartaric Acid 100° (48)		$C_{12}H_{22}O_{11}$ Sucrose 0° (5, 43, 44, 45)				$(CH_3)_4NCl$ 100° (48)	
0.1	3.47	2.0 | 3.14		0.4 | 2.88		2.0 | 1.97		0.2 | 1.86		1.5 | 3.10	
0.2	3.49	3.0 | 3.22		0.8 | 3.11		3.0 | 2.08		0.5 | 1.89		3.0 | 3.32	
0.3	3.52	5.0 | 3.22		1.5 | 3.11		4.0 | 2.22		1.0 | 1.97		4.0 | 3.45	
0.5	3.58	1.2 | 3.10		2.5 | 3.05		5.3 | 2.29		3.5 | 2.39		6.0 | 3.62	
0.7	3.64	2.5 | 3.27 ₅		3.3 | 3.03		6.5 | 2.24		4.5 | 2.50		10.5 | 3.62	
0.9	3.73	3.0 | 3.27		4.5 | 3.07		10.0 | 2.20		5.0 | 2.55			
1.1	3.82	4.0 | 3.25		5.0 | 3.09				6.0 | 2.59			
1.3	3.93	6.0 | 3.21		5.5 | 3.11				7.0 | 2.63			
1.7	4.20	12 | 2.91		6.0 | 3.10							
1.8	4.27										
NH_4NO_3 <i>v. also</i> p. 362 40° (37)		NH_4I 100° (48)		$(NH_4)_2S_2O_6$ 100° (48)		<i>dl</i> -Tartaric acid 100° (48)				CH_3NH_3Cl 100° (48)	
11.5	1.51	0.8 | 3.29		0.5 | 3.56 ₆		0.7 | 2.17		1.0 | 1.94		1.0 | 2.63	
19.0	1.54	1.8 | 3.27		1.5 | 3.77		3.0 | 2.14		1.7 | 2.05		2.0 | 2.85	
60° (37)		3.0 | 3.39		2.0 | 3.84		5.0 | 2.24		3.0 | 2.25		3.5 | 3.06	
11.5	1.75	4.0 | 3.45		3.0 | 3.93		7.0 | 2.37		4.0 | 2.36		7.0 | 3.03	
19.0	1.47	4.5 | 3.45		4.0 | 3.98		8.0 | 2.49		5.0 | 2.46		10.0 | 2.87	
80° (37)		6.5 | 3.40						6.5 | 2.55		14.5 | 2.62	
11.5	1.99	10.5 | 3.19						20-25° (3, 35; <i>cf.</i> 52)		$(CH_3)_3NHCl$ 100° (48)	
19.0	1.40	14.5 | 2.95						0.1 | 1.76		1.3 | 2.21	
100° (48)								0.4 | 1.80		7.5 | 3.02	
0.6	3.10							1.0 | 1.91		10.0 | 2.99	
0.7	2.88							2.0 | 2.09			
1.5	2.79							3.0 | 2.23			
2.5	2.76							4.0 | 2.35			
4.0	2.72							5.0 | 2.45			
5.0	2.69							100° (46)			
6.5	2.61							0.3 | 1.82		1.0 | 2.70	
12	2.27							0.6 | 1.85		2.0 | 2.60	
15	2.10							0.8 | 1.88		3.0 | 2.50	
24	1.77							1.2 | 1.91		4.0 | 2.42	
								1.5 | 1.94		5.0 | 2.34	
NH_4Cl <i>v. also</i> p. 362 30-95° (47, 48)		NH_4HSO_4 100° (48)		H_3PO_4 0° (12, 13, 14, 15)		$C_6H_6O_3$ Pyrogallol 23° (6)				$(C_2H_5)_3NHCl$ 100° (48)	
1.0	2.70	1.0 | 3.04		0.1 | 1.80		2.4 | 1.08		0.3 | 1.82		1.0 | 1.96	
3.0	3.01	2.5 | 3.09		0.2 | 1.88		4.0 | 0.89		0.6 | 1.85		1.5 | 2.20	
4.0	3.06	3.5 | 3.12		0.3 | 1.95		6.0 | 0.96		0.8 | 1.88		3.0 | 2.83	
5.0	3.03	5.0 | 3.11		0.5 | 2.07		8.8 | 0.87		1.2 | 1.91		4.5 | 3.04	
9.5	2.81	9.0 | 2.95		1.0 | 2.26				1.5 | 1.94		6.5 | 3.13	
100°		12.0 | 2.78								7.5 | 3.04	
NH_4Cl <i>v. also</i> p. 362 30-95° (47, 48)		$(NH_4)_2SO_4$ (47, 48) <i>v. also</i> p. 363		H_3AsO_4 100° (48)		$C_6H_8O_7$ Citric acid 100° (48)				NH_4CNS 100° (48)	
1.0	2.70	50°		1.0 | 1.93		1.0 | 1.90		0° (12, 13, 14, 15)		1.0 | 2.88	
3.0	3.01	60°		2.0 | 1.98		6.0 | 2.48		0.2 | 1.66		1.5 | 2.99	
4.0	3.06	65°		3.0 | 2.02				1.0 | 1.72		3.5 | 3.01	
5.0	3.03	70°		4.5 | 2.05						4.5 | 3.10	
9.5	2.81	75°								21.0 | 2.27	
100°		80°									
2.0	3.06	85°									
4.0	3.12										
5.0	3.12										
7.5	2.95										
11.5	2.77										
NH_4OCl Hydroxylamine hydrochloride											

<div><div>Pb(NO₃)₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.6</div><div>3.23</div></div><div><div>1.2</div><div>3.15</div></div><div><div>2.1</div><div>2.96</div></div><div><div>2.4</div><div>2.88</div></div><div><div>3.4</div><div>2.69</div></div></div>	<div><div>M</div><div>100R</div></div> <div>100° (48)</div> <div><div>0.5</div><div>4.36</div></div> <div><div>1.1</div><div>5.24</div></div> <div><div>1.7</div><div>5.96</div></div> <div><div>2.2</div><div>6.40</div></div> <div><div>3.1</div><div>6.98</div></div> <div><div>4.1</div><div>7.38</div></div>	<div><div>M</div><div>100R</div></div> <div>100° (48)</div> <div><div>0.8</div><div>1.18</div></div> <div><div>1.2</div><div>1.14</div></div> <div><div>1.5</div><div>1.13</div></div> <div><div>2.0</div><div>1.20</div></div> <div><div>2.4</div><div>1.27</div></div> <div><div>Hg(CN)₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.5</div><div>1.72</div></div><div><div>0.8</div><div>1.64</div></div><div><div>1.0</div><div>1.61</div></div><div><div>1.2</div><div>1.63</div></div></div> <div><div>CuCl₂</div><div><div>M</div><div>100R</div></div><div>23° (6)</div><div><div>1.5</div><div>2.22</div></div><div><div>2.0</div><div>2.29</div></div><div><div>4.0</div><div>2.50</div></div><div><div>5.5</div><div>2.59</div></div><div><div>8.5</div><div>2.65</div></div></div> <div><div>CuSO₄ (47, 48)</div><div><div>M</div><div>100R</div></div><div>50°</div><div><div>1.2</div><div>1.87</div></div><div><div>1.9</div><div>2.44</div></div><div>60°</div><div><div>1.2</div><div>1.79</div></div><div><div>1.9</div><div>2.31</div></div><div>70°</div><div><div>1.2</div><div>1.65</div></div><div><div>1.9</div><div>2.10</div></div><div>80°</div><div><div>1.2</div><div>1.55</div></div><div><div>1.9</div><div>1.98</div></div><div>90°</div><div><div>1.2</div><div>1.49</div></div><div><div>1.9</div><div>1.90</div></div><div>100°</div><div><div>0.7</div><div>1.61</div></div><div><div>1.5</div><div>1.67</div></div><div><div>2.5</div><div>1.91</div></div><div><div>3.5</div><div>2.21</div></div></div>	<div><div>M</div><div>100R</div></div> <div>75°</div> <div><div>2.0</div><div>1.61</div></div> <div><div>3.3</div><div>2.58</div></div> <div>80°</div> <div><div>2.0</div><div>1.54</div></div> <div><div>3.3</div><div>2.42</div></div> <div>85°</div> <div><div>2.0</div><div>1.50</div></div> <div><div>3.3</div><div>2.30</div></div> <div>90°</div> <div><div>2.0</div><div>1.44</div></div> <div><div>3.3</div><div>2.15</div></div> <div>95°</div> <div><div>2.0</div><div>1.38</div></div> <div><div>3.3</div><div>1.98</div></div> <div>100°</div> <div><div>0.3</div><div>1.70</div></div> <div><div>1.0</div><div>1.46</div></div> <div><div>1.6</div><div>1.32</div></div> <div><div>1.8</div><div>1.35</div></div> <div><div>2.0</div><div>1.39</div></div> <div><div>2.7</div><div>1.56</div></div> <div><div>AgNO₃</div><div><div>M</div><div>100R</div></div><div>23 ± 1° (6)</div><div><div>1.0</div><div>1.63</div></div><div><div>2.0</div><div>1.60</div></div><div><div>5.0</div><div>1.53</div></div><div><div>8.0</div><div>1.50</div></div></div> <div><div>FeCl₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.3</div><div>4.23</div></div><div><div>1.5</div><div>5.11</div></div><div><div>2.0</div><div>5.47</div></div><div><div>3.5</div><div>6.23</div></div><div><div>4.0</div><div>6.40</div></div><div><div>6.0</div><div>6.56</div></div><div><div>7.0</div><div>6.34</div></div></div> <div><div>FeSO₄ (47, 48)</div><div><div>M</div><div>100R</div></div><div>50°</div><div><div>1.7</div><div>2.06</div></div><div><div>3.0</div><div>2.56</div></div><div>60°</div><div><div>1.7</div><div>2.01</div></div><div><div>3.0</div><div>2.42</div></div><div>65°</div><div><div>1.7</div><div>1.99</div></div><div><div>3.0</div><div>2.35</div></div><div>70°</div><div><div>1.7</div><div>1.96</div></div><div><div>3.0</div><div>2.24</div></div><div>75°</div><div><div>1.7</div><div>1.94</div></div><div><div>3.0</div><div>2.17</div></div><div>80°</div><div><div>1.7</div><div>1.91</div></div><div><div>3.0</div><div>2.11</div></div><div>85°</div><div><div>1.7</div><div>1.88</div></div><div><div>3.0</div><div>2.06</div></div><div>90°</div><div><div>1.7</div><div>1.84</div></div><div><div>3.0</div><div>2.02</div></div><div>95°</div><div><div>1.7</div><div>1.82</div></div><div><div>3.0</div><div>1.95</div></div></div>	<div><div>M</div><div>100R</div></div> <div>100°</div> <div><div>0.5</div><div>1.53</div></div> <div><div>1.0</div><div>1.38</div></div> <div><div>1.5</div><div>1.37</div></div> <div><div>2.0</div><div>1.56</div></div> <div><div>3.0</div><div>1.84</div></div> <div><div>3.5</div><div>1.87</div></div> <div><div>CoCl₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.5</div><div>3.94</div></div><div><div>1.0</div><div>4.67</div></div><div><div>2.0</div><div>5.44</div></div><div><div>2.2</div><div>5.57</div></div><div><div>3.2</div><div>6.02</div></div><div><div>4.5</div><div>6.17</div></div></div> <div><div>CoCl₃</div><div><div>t, °C</div><div>100R</div></div><div>M = 2.85 (10)</div><div><div>20</div><div>21.4</div></div><div><div>30</div><div>22.1</div></div><div><div>40</div><div>23.1</div></div><div><div>50</div><div>24.6</div></div><div><div>60</div><div>25.6</div></div><div><div>70</div><div>26.0</div></div><div><div>80</div><div>26.0</div></div><div><div>90</div><div>26.3</div></div></div> <div><div>CoSO₄</div><div><div>M</div><div>100R</div></div><div>M = 2.901 (47, 48)</div><div><div>30</div><div>2.70</div></div><div><div>50</div><div>2.67</div></div><div><div>60</div><div>2.63</div></div><div><div>70</div><div>2.53</div></div><div><div>80</div><div>2.40</div></div><div><div>90</div><div>2.24</div></div><div><div>100</div><div>1.79</div></div><div>M = 1.612 (47, 48)</div><div><div>30</div><div>1.75</div></div><div><div>40</div><div>1.79</div></div><div><div>50</div><div>1.81</div></div><div><div>60</div><div>1.78</div></div><div><div>70</div><div>1.72</div></div><div><div>100</div><div>1.39</div></div></div> <div><div>NiCl₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>1.0</div><div>5.04</div></div><div><div>3.0</div><div>6.72</div></div><div><div>4.0</div><div>7.25</div></div><div><div>5.0</div><div>7.40</div></div><div><div>7.0</div><div>7.02</div></div></div> <div><div>NiSO₄</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>0.5</div><div>1.22</div></div><div><div>1.0</div><div>1.27</div></div><div><div>1.5</div><div>1.39</div></div><div>30° (47)</div><div><div>1.7</div><div>1.98</div></div><div><div>2.9</div><div>2.70</div></div><div>40°</div><div><div>1.7</div><div>1.94</div></div><div><div>2.9</div><div>2.62</div></div><div>50°</div><div><div>1.7</div><div>1.90</div></div><div><div>2.9</div><div>2.58</div></div><div>60°</div><div><div>1.7</div><div>1.85</div></div><div><div>2.9</div><div>2.51</div></div><div>65°</div><div><div>1.7</div><div>1.82</div></div><div><div>2.9</div><div>2.48</div></div><div>70°</div><div><div>1.7</div><div>1.79</div></div><div><div>2.9</div><div>2.44</div></div><div>75°</div><div><div>1.7</div><div>1.74</div></div><div><div>2.9</div><div>2.35</div></div><div>80°</div><div><div>1.7</div><div>1.68</div></div><div><div>2.9</div><div>2.28</div></div><div>85°</div><div><div>1.7</div><div>1.65</div></div><div><div>2.9</div><div>2.25</div></div><div>90°</div><div><div>1.7</div><div>1.60</div></div><div><div>2.9</div><div>2.17</div></div><div>95°</div><div><div>1.7</div><div>1.53</div></div><div><div>2.9</div><div>2.10</div></div><div>100°</div><div><div>0.7</div><div>1.33</div></div><div><div>1.3</div><div>1.33</div></div><div><div>1.7</div><div>1.34</div></div><div><div>2.2</div><div>1.47</div></div><div><div>2.5</div><div>1.67</div></div></div>	<div><div>Ni(NO₃)₂</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>1.0</div><div>4.70</div></div><div><div>3.0</div><div>7.20</div></div><div><div>3.6</div><div>8.10</div></div><div>100° (48)</div><div><div>0.5</div><div>4.40</div></div><div><div>2.5</div><div>6.45</div></div><div><div>3.5</div><div>7.30</div></div><div><div>4.0</div><div>7.60</div></div><div><div>4.5</div><div>7.70</div></div></div> <div><div>UO₂(NO₃)₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.4</div><div>4.72</div></div><div><div>1.2</div><div>5.54</div></div></div> <div><div>H₃BO₃</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.8</div><div>1.58</div></div><div><div>2.0</div><div>1.65</div></div><div><div>3.5</div><div>1.67</div></div><div><div>4.5</div><div>1.67</div></div></div>
<div><div>Pb(C₂H₃O₂)₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>1.0</div><div>1.87</div></div><div><div>1.5</div><div>1.64</div></div><div><div>2.0</div><div>1.54</div></div><div><div>5.0</div><div>1.32</div></div><div><div>6.0</div><div>1.30</div></div></div> <div><div>ZnCl₂</div><div><div>M</div><div>100R</div></div><div>14.6° (29)</div><div><div>11.0</div><div>5.90</div></div><div><div>13.5</div><div>5.89</div></div><div><div>17.0</div><div>5.22</div></div><div>24.6°</div><div><div>11.0</div><div>5.93</div></div><div><div>13.5</div><div>5.78</div></div><div><div>17.0</div><div>5.14</div></div><div>29.6°</div><div><div>11.0</div><div>5.93</div></div><div><div>13.5</div><div>5.72</div></div><div><div>17.0</div><div>5.09</div></div><div>100° (29, 48)</div><div><div>1.3</div><div>2.70</div></div><div><div>2.7</div><div>3.20</div></div><div><div>5.0</div><div>4.03</div></div><div><div>7.0</div><div>4.64</div></div><div><div>9.0</div><div>5.04</div></div></div> <div><div>ZnSO₄</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>0.5</div><div>1.19</div></div><div><div>1.0</div><div>1.34</div></div><div><div>1.5</div><div>1.57</div></div><div><div>2.0</div><div>1.84</div></div><div><div>2.5</div><div>2.24</div></div><div>50° (47)</div><div><div>1.9</div><div>2.15</div></div><div><div>2.8</div><div>3.60</div></div><div>65° (47)</div><div><div>1.9</div><div>2.02</div></div><div><div>2.8</div><div>3.36</div></div><div>80° (47)</div><div><div>1.9</div><div>1.82</div></div><div><div>2.8</div><div>2.98</div></div><div>95° (47)</div><div><div>1.9</div><div>1.61</div></div><div><div>2.8</div><div>2.68</div></div><div>100° (48)</div><div><div>1.0</div><div>1.35</div></div><div><div>1.5</div><div>1.23</div></div><div><div>2.2</div><div>1.50</div></div><div><div>2.7</div><div>1.70</div></div><div><div>4.8</div><div>2.38</div></div></div> <div><div>Zn(NO₃)₂</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>0.5</div><div>4.22</div></div><div><div>3.0</div><div>7.20</div></div><div><div>3.7</div><div>7.90</div></div></div>	<div><div>CdCl₂</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>1.0</div><div>2.05</div></div><div><div>1.5</div><div>2.02</div></div><div><div>2.0</div><div>2.06</div></div><div><div>3.0</div><div>2.03</div></div><div><div>4.0</div><div>2.05</div></div><div>100° (48)</div><div><div>1.0</div><div>2.48</div></div><div><div>2.0</div><div>2.39</div></div><div><div>3.0</div><div>2.45</div></div><div><div>3.5</div><div>2.51</div></div><div><div>3.8</div><div>2.54</div></div><div><div>5.4</div><div>2.65</div></div><div><div>5.6</div><div>2.66</div></div></div> <div><div>Cd(ClO₃)₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.5</div><div>4.58</div></div><div><div>1.0</div><div>5.30</div></div><div><div>1.5</div><div>5.68</div></div><div><div>2.0</div><div>6.15</div></div><div><div>3.0</div><div>6.80</div></div><div><div>5.4</div><div>7.48</div></div></div> <div><div>CdBr₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>1.0</div><div>2.31</div></div><div><div>2.0</div><div>2.37</div></div><div><div>3.0</div><div>2.43</div></div><div><div>4.0</div><div>2.64</div></div></div> <div><div>CdI₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>1.0</div><div>1.98</div></div><div><div>2.0</div><div>2.21</div></div><div><div>3.0</div><div>2.37</div></div></div> <div><div>Cd(NO₃)₂</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>0.5</div><div>4.13</div></div><div><div>1.0</div><div>4.62</div></div><div><div>1.5</div><div>5.06</div></div><div><div>2.0</div><div>5.44</div></div><div><div>4.0</div><div>6.50</div></div><div>100° (48)</div><div><div>0.3</div><div>4.02</div></div><div><div>0.8</div><div>4.47</div></div><div><div>1.0</div><div>4.62</div></div><div><div>2.0</div><div>5.09</div></div><div><div>4.0</div><div>5.76</div></div></div> <div><div>CdSO₄</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>0.5</div><div>1.02</div></div><div><div>1.0</div><div>1.42</div></div><div><div>1.5</div><div>1.69</div></div><div><div>2.2</div><div>2.14</div></div><div><div>2.5</div><div>2.35</div></div><div><div>3.2</div><div>3.16</div></div></div>	<div><div>CuSO₄ (47, 48)</div><div><div>M</div><div>100R</div></div><div>50°</div><div><div>1.2</div><div>1.87</div></div><div><div>1.9</div><div>2.44</div></div><div>60°</div><div><div>1.2</div><div>1.79</div></div><div><div>1.9</div><div>2.31</div></div><div>70°</div><div><div>1.2</div><div>1.65</div></div><div><div>1.9</div><div>2.10</div></div><div>80°</div><div><div>1.2</div><div>1.55</div></div><div><div>1.9</div><div>1.98</div></div><div>90°</div><div><div>1.2</div><div>1.49</div></div><div><div>1.9</div><div>1.90</div></div><div>100°</div><div><div>0.7</div><div>1.61</div></div><div><div>1.5</div><div>1.67</div></div><div><div>2.5</div><div>1.91</div></div><div><div>3.5</div><div>2.21</div></div></div> <div><div>MnCl₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.7</div><div>4.10</div></div><div><div>1.5</div><div>4.74</div></div><div><div>2.5</div><div>5.18</div></div><div><div>3.5</div><div>5.44</div></div><div><div>4.0</div><div>5.51</div></div><div><div>5.3</div><div>5.48</div></div></div> <div><div>MnSO₄ (47, 48)</div><div><div>M</div><div>100R</div></div><div>40°</div><div><div>2.0</div><div>1.82</div></div><div><div>3.3</div><div>3.20</div></div><div>50°</div><div><div>2.0</div><div>1.79</div></div><div><div>3.3</div><div>3.06</div></div><div>60°</div><div><div>2.0</div><div>1.76</div></div><div><div>3.3</div><div>2.93</div></div><div>65°</div><div><div>2.0</div><div>1.70</div></div><div><div>3.3</div><div>2.82</div></div><div>70°</div><div><div>2.0</div><div>1.66</div></div><div><div>3.3</div><div>2.70</div></div></div>	<div><div>CoCl₃</div><div><div>t, °C</div><div>100R</div></div><div>M = 2.85 (10)</div><div><div>20</div><div>21.4</div></div><div><div>30</div><div>22.1</div></div><div><div>40</div><div>23.1</div></div><div><div>50</div><div>24.6</div></div><div><div>60</div><div>25.6</div></div><div><div>70</div><div>26.0</div></div><div><div>80</div><div>26.0</div></div><div><div>90</div><div>26.3</div></div></div> <div><div>CoSO₄</div><div><div>M</div><div>100R</div></div><div>M = 2.901 (47, 48)</div><div><div>30</div><div>2.70</div></div><div><div>50</div><div>2.67</div></div><div><div>60</div><div>2.63</div></div><div><div>70</div><div>2.53</div></div><div><div>80</div><div>2.40</div></div><div><div>90</div><div>2.24</div></div><div><div>100</div><div>1.79</div></div><div>M = 1.612 (47, 48)</div><div><div>30</div><div>1.75</div></div><div><div>40</div><div>1.79</div></div><div><div>50</div><div>1.81</div></div><div><div>60</div><div>1.78</div></div><div><div>70</div><div>1.72</div></div><div><div>100</div><div>1.39</div></div></div> <div><div>NiCl₂</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>1.0</div><div>5.60</div></div><div><div>2.0</div><div>7.15</div></div><div><div>2.6</div><div>9.00</div></div><div>100° (48)</div><div><div>0.5</div><div>4.25</div></div><div><div>2.5</div><div>6.05</div></div><div><div>3.0</div><div>6.45</div></div><div><div>3.5</div><div>6.75</div></div><div><div>4.0</div><div>7.00</div></div><div><div>5.0</div><div>7.25</div></div></div> <div><div>NiSO₄</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>0.5</div><div>1.22</div></div><div><div>1.0</div><div>1.27</div></div><div><div>1.5</div><div>1.39</div></div><div>30° (47)</div><div><div>1.7</div><div>1.98</div></div><div><div>2.9</div><div>2.70</div></div><div>40°</div><div><div>1.7</div><div>1.94</div></div><div><div>2.9</div><div>2.62</div></div><div>50°</div><div><div>1.7</div><div>1.90</div></div><div><div>2.9</div><div>2.58</div></div><div>60°</div><div><div>1.7</div><div>1.85</div></div><div><div>2.9</div><div>2.51</div></div><div>65°</div><div><div>1.7</div><div>1.82</div></div><div><div>2.9</div><div>2.48</div></div><div>70°</div><div><div>1.7</div><div>1.79</div></div><div><div>2.9</div><div>2.44</div></div><div>75°</div><div><div>1.7</div><div>1.74</div></div><div><div>2.9</div><div>2.35</div></div><div>80°</div><div><div>1.7</div><div>1.68</div></div><div><div>2.9</div><div>2.28</div></div><div>85°</div><div><div>1.7</div><div>1.65</div></div><div><div>2.9</div><div>2.25</div></div><div>90°</div><div><div>1.7</div><div>1.60</div></div><div><div>2.9</div><div>2.17</div></div><div>95°</div><div><div>1.7</div><div>1.53</div></div><div><div>2.9</div><div>2.10</div></div><div>100°</div><div><div>0.7</div><div>1.33</div></div><div><div>1.3</div><div>1.33</div></div><div><div>1.7</div><div>1.34</div></div><div><div>2.2</div><div>1.47</div></div><div><div>2.5</div><div>1.67</div></div></div>	<div><div>Ni(NO₃)₂</div><div><div>M</div><div>100R</div></div><div>0° (11)</div><div><div>1.0</div><div>4.70</div></div><div><div>3.0</div><div>7.20</div></div><div><div>3.6</div><div>8.10</div></div><div>100° (48)</div><div><div>0.5</div><div>4.40</div></div><div><div>2.5</div><div>6.45</div></div><div><div>3.5</div><div>7.30</div></div><div><div>4.0</div><div>7.60</div></div><div><div>4.5</div><div>7.70</div></div></div> <div><div>UO₂(NO₃)₂</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.4</div><div>4.72</div></div><div><div>1.2</div><div>5.54</div></div></div> <div><div>H₃BO₃</div><div><div>M</div><div>100R</div></div><div>100° (48)</div><div><div>0.8</div><div>1.58</div></div><div><div>2.0</div><div>1.65</div></div><div><div>3.5</div><div>1.67</div></div><div><div>4.5</div><div>1.67</div></div></div>	

AlCl ₃		M	100R	M	100R	M	100R	M	100R	M	100R	M	100R	M	100R			
M	100R	1.0	3.13	4.4	3.03	1.0	6.48	1.5	1.51	9.0	7.03	1.0	3.10	1.0	3.00			
100° (48)		1.5	3.39	85°		1.5	7.33	2.0	1.63	11.5	6.30	1.3	3.80	1.3	3.80			
0.5	5.90	2.0	3.80	1.5	1.42	3.0	10.05	2.5	1.83	14.0	5.57	1.5	4.61	1.5	4.61			
0.7	6.55	3.0	4.50	3.0	2.21	40°		4.3	2.62	130°		1.7	5.64	1.7	5.64			
1.2	8.50	CeCl ₃		4.4	2.95	1.0	6.28	Mg(HSO ₄) ₂		8.0	7.10	CaBr ₂ (47, 48)		50°				
1.5	9.85	100° (48)		95°		1.5	7.18	100° (48)		12.5	5.92	140°		140°				
1.8	10.90	0.3	5.10	1.5	1.35	3.0	9.80	0.3	4.69	14.0	5.51	11.0		6.15	11.0	6.15		
2.3	12.65	2.0	9.00	3.0	2.10	50°		0.5	5.00	13.0	5.71	13.0		5.71	13.0	5.71		
2.8	13.57	2.5	9.52	4.4	2.81	1.0	6.13	0.8	5.53	14.0	5.44	14.0		5.44	14.0	5.44		
3.4	14.05	4.0	10.50	100° (48)		1.5	7.00	1.2	6.28			CaBr ₂ (47, 48)		50°				
Al ₂ (SO ₄) ₃ (47, 48)		BeCl ₂		1.0	1.55	3.0	9.68	1.6	7.04			50°		50°				
40°		100° (48)		2.0	1.80	65°		2.2	7.99			70°		70°				
0.3	2.60	0.4	4.35	3.6	2.56	1.0	5.90	Mg(NO ₃) ₂				85°		85°				
0.6	3.14	0.8	5.17	6.0	3.55	1.5	6.78	100° (48)				95°		95°				
0.9	5.54	1.2	5.87	Be(NO ₃) ₂		3.0	9.38	0.3		4.39			100°		100°			
1.15	6.99	1.8	6.90	100° (48)		1.0	5.73	1.0		5.43			0°		0°			
50°		2.2	7.55	0.3	3.86	1.5	6.57	2.0		6.05			1.0		5.77	1.0	5.77	
0.3	2.52	2.5	7.95	0.9	5.28	3.0	9.13	2.5		6.53			3.0		8.33	3.0	8.33	
0.6	3.10	3.0	8.55	MgCl ₂ (47, 48)		0.4	4.55	3.4		7.88			4.0		9.42	4.0	9.42	
0.9	5.48	4.4	9.67	<i>v. also p. 367</i>		1.0	5.60	CaCl ₂ (2, 11, 12, 13, 14, 15, 34, 36, 39, 48)				85°		85°				
1.15	6.83	5.0	9.70	30°		2.5	8.27	0°				95°		95°				
60°		BeBr ₂		40°		3.5	9.55	4.0		8.23			100°		100°			
0.3	2.45	100° (48)		50°		4.0	10.02	5.0		9.17			0.5		4.71	0.5	4.71	
0.6	3.04	0.7	5.20	60°		5.0	10.65	6.0		9.53			1.0		5.46	1.0	5.46	
0.9	5.38	0.9	6.00	70°		MgSO ₄ (47, 48)		7.0		10.15			2.0		7.00	2.0	7.00	
1.15	6.70	1.5	7.30	80°		50°		11.0		10.62			3.0		7.98	3.0	7.98	
65°		2.0	8.15	90°		60°		2.0		10.56			4.0		9.00	4.0	9.00	
0.3	2.40	2.5	9.00	100°		70°		2.5		8.10			5.5		9.94	5.5	9.94	
0.6	3.00	3.2	10.15	BeSO_4 (47)		80°		4.0		8.10			CaI ₂ (12, 13, 14, 15)		0°			
0.9	5.30	4.2	10.90	30°		90°		5.0		9.70			0°		0°			
1.15	6.60	4.6	11.50	40°		100°		6.0		9.76			1.0		4.49	1.0	4.49	
70°		BeSO ₄ (47)		50°		110°		7.0		9.76			2.0		5.36	2.0	5.36	
0.3	2.33	30°		60°		120°		8.0		9.49			5.0		7.21	5.0	7.21	
0.6	2.93	1.5	1.86	70°		130°		9.0		9.02			7.0		7.39	7.0	7.39	
0.9	5.21	3.0	2.96	80°		140°		12.0		7.14			CaS ₂ O ₃ (48)		100°			
1.15	6.51	4.3	3.83	90°		150°		1.0		5.75			100°		100°			
75°		40°		100°		160°		2.0		7.37			0.6		2.68	0.6	2.68	
0.3	2.27	50°		110°		170°		3.0		8.35			1.5		3.14	1.5	3.14	
0.6	2.88	60°		120°		180°		4.0		9.15			2.0		3.17	2.0	3.17	
0.9	5.13	70°		130°		190°		5.0		9.95			3.0		4.47	3.0	4.47	
1.15	6.39	80°		140°		200°		6.0		10.75			4.5		5.70	4.5	5.70	
80°		90°		150°		210°		7.0		11.55			5.5		6.94	5.5	6.94	
0.3	2.22	100°		160°		220°		8.0		12.35			Ca(NO ₃) ₂ (48)		100°			
0.6	2.83	110°		170°		230°		9.0		13.15			100°		100°			
0.9	5.05	120°		180°		240°		10.0		13.95			0.5		4.23	0.5	4.23	
1.15	6.28	130°		190°		250°		11.0		14.75			1.5		4.77	1.5	4.77	
90°		140°		200°		260°		12.0		15.55			4.0		5.37	4.0	5.37	
0.3	2.12	150°		210°		270°		13.0		16.35			4.5		5.40	4.5	5.40	
0.6	2.67	160°		220°		280°		14.0		17.15			5.0		5.43	5.0	5.43	
0.9	4.71	170°		230°		290°		15.0		17.95			10.0		5.20	10.0	5.20	
1.15	5.84	180°		240°		300°		16.0		18.75			Ca ₂ Fe(CN) ₆ (4)		0°			
95°		190°		250°		310°		17.0		19.55			0°		0°			
0.3	2.06	200°		260°		320°		18.0		20.35			1.0		3.00	1.0	3.00	
0.6	2.58	210°		270°		330°		19.0		21.15			1.3		3.80	1.3	3.80	
0.9	4.53	220°		280°		340°		20.0		21.95			1.5		4.61	1.5	4.61	
1.15	5.63	230°		290°		350°		21.0		22.75			1.7		5.64	1.7	5.64	
100°		240°		300°		360°		22.0		23.55								
0.3	3.23	250°		310°				23.0		24.35								
0.4	3.10	260°		320°				24.0		25.15								
0.7	3.80	270°		330°				25.0		25.95								
1.05	4.90	280°		340°				26.0		26.75								
1.17	5.77	290°		350°				27.0		27.55								
AlNH ₄ (SO ₄) ₂		80°						28.0		28.35								
100° (48)								29.0		29.15								
0.5	3.10							30.0		30.00								

SrCl₂ (47, 48)		Ba(OH)₂ (48)		M		M		M		LiNO₃ (47, 48)	
M	100R	M	100R	85°	100R	20° (25)	100R	65°	100R	M	100R
	30°		100°								30-40°
0.7	5.10	0.5	3.25	1.0	5.05	0.1	3.29	0.8	3.73	2.0	4.91
1.3	6.03	0.8	3.12	1.7	5.80	0.8	3.50	3.8	5.23	5.0	4.88
1.8	6.82	1.1	2.95	2.5	6.45	1.0	3.57			9.0	5.50
	50°	1.9	2.63	3.4	6.89		40° (47)	1.0	3.78	12.5	5.24
0.7	4.93	BaCl₂ (47)			90°	2.0	3.86	3.8	5.13		55°
1.3	5.88		50-95°	1.0	5.02	5.0	4.95		75°	2.0	4.77
1.8	6.59			1.7	5.76	6.0	5.20	1.0	3.75	5.0	4.79
	70°	0.5	4.36	2.5	6.41		60° (47)	3.8	5.10	9.0	5.42
0.7	4.73	1.4	5.07	3.4	6.86	3.0	4.13		80°	12.5	5.16
1.3	5.64	1.9	5.03		95°	5.0	4.85	1.5	3.96		70°
1.8	6.29		100°	1.0	4.98	6.0	5.10	3.8	5.07	2.0	4.73
	90°	0.5	4.33	1.7	5.72		80° (47)		85°	5.0	4.72
0.7	4.60	1.0	4.85	2.5	6.37	2.0	3.75	1.5	3.95	9.0	5.34
1.3	5.47	1.7	5.10	3.4	6.82	3.0	4.09	3.8	5.04	12.5	5.07
1.8	6.06	2.5	5.30		100° (48)	5.0	4.70		95°		80°
	100°			0.4	4.34	6.0	4.92	0.8	3.61	2.0	4.68
0.5	4.31	Ba(ClO₃)₂ (48)		0.6	4.58		100° (48)	3.8	5.01	5.0	4.68
1.5	5.52		100°	1.2	5.25	1.0	3.38		100°	9.0	5.29
2.0	6.03	0.3	4.09	1.8	5.81	4.0	4.35	0.8	3.68	12.5	5.02
2.5	6.49	0.7	4.27	2.7	6.47	6.0	4.82	1.3	3.84		90°
3.0	6.86	1.1	4.41	3.0	6.60	8.0	5.14	2.6	4.44	2.0	4.64
4.0	7.38	1.5	4.53	3.5	6.74	9.0	5.24	4.5	5.29	5.0	4.64
4.5	7.49	2.5	4.77	4.2	6.80	10.0	5.21	6.5	6.00	9.0	5.25
5.4	7.38	2.7	4.81	4.4	6.76	12.0	5.02	10.0	6.47	12.5	4.97
		2.8	4.79	BaS₂O₆		15.0	4.69	11.0	6.44		100°
SrBr₂ (47, 48)					100° (48)	23.0	3.67	12.5	6.28	0.5	3.02
	50°	BaBr₂ (47)		1.0	1.97	LiBr (47, 48)		Li₂SO₄ (47, 48)		1.0	3.31
0.8	5.60		40°	1.5	2.25	<i>v. also p. 369</i>			65°	2.0	3.63
3.2	9.10	1.0	5.33	1.7	2.27	30°		0.5	3.87	3.0	3.85
	70°	1.7	6.14	1.8	2.26	1.5	5.07	1.0	4.14	5.0	4.08
0.8	5.45	2.5	6.79	Ba(NO₃)₂		7.0	6.63	1.4	4.48	6.0	4.13
1.6	6.62	3.4	7.28		100° (48)		50°		70°	8.0	4.15
2.4	7.75		50°	0.5	3.55	2.0	4.65	0.5	3.68	11.0	4.03
3.2	8.80	1.0	5.27	0.7	3.54	3.5	5.13	1.0	3.94	12.0	3.96
	90°	1.7	6.08	0.9	3.51	5.0	5.53	1.4	4.23	18.5	3.57
0.8	5.30	2.5	6.73	1.0	3.488	7.0	5.96		75°		
1.6	6.45	3.4	7.22	1.2	3.454		70-95°	0.5	3.52	Li₂SiF₆	
2.4	7.55		60°	Ba(C₂H₃O₂)₂		2.0	3.97	1.4	4.10		100° (48)
3.2	8.50	1.0	5.24		100° (48)	3.5	4.60		80°	0.5	4.16
	100°	1.7	6.03	0.8	3.76	5.0	5.15	0.5	3.41	1.2	4.13
0.4	4.55	2.5	6.68	1.6	3.73	7.0	5.66	1.4	3.97	3.0	4.64
0.6	4.80	3.4	7.15	2.2	3.53		100°		90°		
2.0	6.70		65°	2.8	3.38	0.5	3.19	0.5	3.34	Li₂CrO₄	
2.5	7.35	1.0	5.20	Ba(BF₄)₂		1.5	3.65	1.4	3.91		100° (48)
2.8	7.70	1.7	5.98		100° (48)	2.5	4.08		100°	1.0	4.20
3.4	8.35	2.5	6.62	0.5	5.33	3.5	4.47	0.5	3.50	3.5	5.48
3.9	8.75	3.4	7.08	1.0	5.59	5.5	5.13	1.0	3.71	4.5	5.92
4.6	9.10		70°	1.8	5.93	6.5	5.39	2.8	3.88		
SrS₂O₆ (48)			75°	2.6	6.12	8.0	5.65	Li₂S₂O₆		NaOH	
	100°	1.0	5.15	3.2	6.19	10.0	5.69		100° (48)	<i>v. also p. 369, 370</i>	
0.6	2.00	1.7	5.92	LiOH (48)		12.0	5.62	0.5	4.06	0° (12, 13, 14, 15)	
1.0	2.27	2.5	6.57		100°	15.5	5.27	1.0	4.87	1.0	3.00
1.8	2.86	3.4	7.02	0.5	4.21	LiI (47, 48)		1.5	5.47	3.0	3.55
2.0	3.14		80°	1.0	4.81	<i>v. also p. 369</i>		2.5	6.45	4.0	3.90
2.4	3.44	1.0	5.12	2.0	5.13	40°		3.0	6.90	5.0	4.31
Sr(NO₃)₂ (48)		1.7	5.89	2.5	5.15	0.8	4.13	4.5	7.60	7.0	4.87
	100°	2.5	6.52	2.8	5.13	3.8	5.17	LiHSO₄		9.0	5.27
0.3	4.23	3.4	6.98	LiCl			50°		100° (48)	10.0	5.42
0.6	4.10				0° (50)	0.8	3.93	0.8	3.44	12.0	5.52
0.9	4.09	1.0	5.09	3.5	4.55	3.8	5.44	1.5	3.61	15.0	5.24
3.0	4.34	1.7	5.85	5.0	5.07		60°	2.0	3.79		
3.7	4.37	2.5	6.48	10.0	5.49	0.8	3.80	3.5	4.19		
		3.4	6.94			3.8	5.32	5.5	4.48		

<i>M</i> | 100 <i>R</i> 25° (34)		<i>M</i> | 100 <i>R</i> 100° (7, 48)		NaI (47, 48) <i>v. also p. 371</i> <i>M</i> | 100 <i>R</i> 30-95°		<i>M</i> | 100 <i>R</i> 50°		<i>M</i> | 100 <i>R</i> 14.0 | 2.43 21.0 | 2.15		Na₂CO₃ (47, 48) <i>v. also p. 372</i> <i>M</i> | 100 <i>R</i> 30°	
4.0	3.64	2.5	3.47	1.0	3.63	1.5	4.02			1.9	4.16
5.0	4.08	3.5	3.57	6.0	4.77	3.0	4.28			2.8	4.32
6.0	4.40	4.0	3.62			3.5	4.38	Na₃PO₄ 100° (48)			
7.0	4.69	5.0	3.76			4.7	5.20	0.6	4.41		
8.0	4.92	6.3	3.91	100°				1.0	4.05	40°	
9.0	5.09	6.7	3.89	0.7	3.25	1.5	4.00	1.5	3.71	1.0	3.85
10.0	5.21	NaClO₃ <i>v. also p. 369, 370</i> 40 to 95° (47)		1.5	3.62	3.0	4.25	2.1	3.45	1.9	4.12
11.0	5.23	2.5	3.28	4.0	4.46	3.5	4.36	2.8	3.32	2.8	4.28
12.5	5.20	5.0	3.26	5.0	4.67	4.7	4.95				
20.0	4.33	12.5	2.81	6.0	4.82			(NaPO₃)₃ 100° (48)		50°	
28.0	3.31	100° (7, 48)		7.0	4.91	1.5	3.96	0.4	4.54	1.0	3.80
100° (48)		1	3.08	9.0	5.00	3.0	4.22	0.7	4.64	1.9	4.01
0.5	3.05	2.5	3.21	11.0	4.89	3.5	4.33	1.0	4.76	2.8	4.16
2.0	3.20	4.5	3.25	17.0	4.25	4.7	4.80				
3.5	3.46	5.5	3.24	20.0	3.85			Na₄P₂O₇ 100° (48)		60°	
5.5	3.73	8.0	3.13	Na₂SO₄ (7, 47, 48) <i>v. also p. 371</i> 40°		1.0	3.86	0.5	3.48	1.0	3.72
8.0	4.00	11.5	2.80	2.5	3.525	4.5	4.60	0.7	3.23	2.8	3.99
10.0	4.16	15.0	2.54	3.5	3.54	5.5	4.74	0.9	3.02		
12.0	4.17	19.0	2.39			6.5	4.73	1.0	2.95	1.0	3.69
15.0	4.09	NaBr (7, 47, 48) <i>v. also p. 371</i> 40°		2.5	3.485	7.0	4.70	1.1	2.90	1.9	3.86
19.0	3.80	2.0	3.49	3.5	3.505	11.5	4.14	1.2	2.91	2.8	3.93
<i>t</i> , °C | 100 <i>R</i>		3.0	3.73			Na₂S₂O₆ 100° (48)		1.3	2.97		
<i>M</i> = 25.0 (30)		4.0	3.93	2.5	3.485	0.8	3.72	NaH₂PO₄ 100° (48)		75°	
225	1.58	5.8	4.15	3.5	3.485	1.6	4.06	1.0	2.65	1.0	3.67
245	1.75					3.0	4.41	2.0	2.40	1.9	3.80
260	1.80	2.0	3.52	2.8	3.465	NaHSO₄ 100° (48)		3.0	2.28	2.8	3.81
270	1.77	3.0	3.77	3.5	3.47	1.5	3.00	4.0	2.20		
280	1.70	4.0	3.97			2.0	3.14	5.0	2.15	85°	
290	1.66	5.8	4.20	2.0	3.445	3.0	3.30	7.0	2.11	1.0	3.66
300	1.66			3.5	3.455	5.0	3.33	11.0	2.07	1.9	3.785
320	1.70	2.0	3.56	1.5	3.44	7.5	3.15			2.8	3.76
335	1.75	3.0	3.80	3.5	3.44	10.0	3.06	Na₂HPO₄ 100° (48)		90°	
350	1.80	4.0	4.00			NaNO₂ 100° (48)		0.5	3.18	1.0	3.64
<i>M</i> = 58.3 (30)		5.8	4.25	1.5	3.395	1.0	3.12	1.0	3.10	1.9	3.77
225	1.02			3.5	3.41	2.0	3.20	1.5	2.99	2.8	3.72
255	1.11	2.0	3.58			4.0	3.26	2.0	2.83		
275	1.15	3.0	3.82	1.5	3.37	6.0	3.22	2.5	2.63	1.0	3.63
300	1.18	4.0	4.02	2.8	3.38	8.0	3.11	3.0	2.56	1.9	3.75
320	1.19	5.8	4.27	3.5	3.39	10.0	2.98	4.0	2.58	2.8	3.68
340	1.19					15.0	2.65	5.5	2.61		
NaF <i>v. p. 369</i>		65°		1.5	3.44	16.0	2.59	6.0	2.69	80°	
NaCl <i>v. also p. 369, 370</i>				3.5	3.41	NaNO₃ <i>v. also p. 372</i> 0° (12, 13, 14, 15, 43, 44, 45)		NaH₂AsO₄ 100° (48)		95°	
<i>M</i> | 100 <i>R</i>		70-95°				1.0	2.88	0.6	2.95	1.0	3.63
0° (12, 13, 14, 15)		2.0	3.61	1.5	3.37	2.0	2.73	1.5	2.59	1.9	3.75
4.0	3.76	3.0	3.86	2.8	3.38	4.0	2.55	2.5	2.52	2.8	3.68
5.0	3.92	4.0	4.06	3.5	3.39	6.0	2.35	3.5	2.48		
5.8	3.99	5.8	4.30			8.0	2.35	4.5	2.45	100°	
20-25° (31, 33)				1.5	3.36	10.0	2.98	6.0	2.43	0.7	3.78
0.1	3.29	100°		2.8	3.37	15.0	2.65			1.0	3.67
0.2	3.28	1.0	3.35	3.5	3.41	16.0	2.59	Na₂HAsO₄ 100° (48)		1.9	3.48
0.4	3.27	2.0	3.63			NaNO₃ <i>v. also p. 372</i> 0° (12, 13, 14, 15, 43, 44, 45)		0.5	3.79	2.2	3.49
0.6	3.27	3.0	3.86	1.5	3.32	1.0	2.88	1.0	3.55	3.0	3.53
0.8	3.28	4.0	4.05	2.8	3.37	2.0	2.73	1.5	3.38	3.9	3.61
1.0	3.30	5.0	4.20	3.5	3.38	4.0	2.55	2.0	3.32	NaCHO₂ Formate <i>v. p. 372</i>	
2.0	3.42	6.0	4.33			6.0	2.35	2.5	3.30	NaC₂H₃O₂ Acetate 100° (48)	
2.8	3.53	7.0	4.39	1.0	3.335	8.0	2.35	3.7	3.33	1.0	3.19
5.0	3.87	8.5	4.41	2.0	3.34	10.0	2.60			2.0	3.45
6.0	3.99	12.0	4.18	3.5	3.345	14.0	2.40			3.0	3.61
80° (47)		NaBrO₃ 100° (48)				NaNO₃ <i>v. also p. 372</i> 30°		Na₂HAsO₄ 100° (48)		4.0	3.73
4.0	3.65	0.6	3.20	1.5	4.06	1.5	4.06	0.5	3.79	5.0	3.79
5.0	3.79	2.5	3.57	3.0	4.31	3.0	4.31	1.0	3.55	6.0	3.80
6.0	3.91	3.7	3.61	3.5	4.46	4.7	5.36	1.5	3.38	8.0	3.73
		5.5	3.54	4.7	5.36			2.0	3.32	9.5	3.61

Na₂C₄H₄O₄ Succinate		<i>M</i>	100 <i>R</i>	<i>M</i>	100 <i>R</i>	<i>M</i>	100 <i>R</i>	KBrO₃		K₂S₂O₃	
<i>M</i> | 100 <i>R</i>		2.2	3.72	8.5	4.06	1.0	2.85	<i>M</i> | 100 <i>R</i>	<i>M</i> | 100 <i>R</i>	<i>M</i> | 100 <i>R</i>	<i>M</i> | 100 <i>R</i>
100° (48)		3.3	5.08	12.0	4.19	1.5	2.82	100° (48)	100° (48)	100° (48)	100° (48)
0.6		4.42	80°		2.0	3.16	2.5	2.74	0.5	3.65	
1.5		4.87	3.5		3.38	3.0	2.71	2.5	3.56		
2.0		5.06	8.5		3.96	4.0	2.64		1.0	3.50	
3.0		5.35	12.0		4.07	4.7	2.55		2.0	3.50	
4.3		5.47	90°		2.0	3.14			3.0	3.63	
Na₂C₄H₄O₆ Tartrate		100° (48)		2.0		3.36	KClO₄		4.0		3.75
100° (48)		0.3		3.5		3.86	100° (48)		5.0		3.83
1.0		0.6		8.5		3.97	0.4		7.5		3.89
2.0		0.7		12.0			0.8		10.5		3.65
3.0		1.0		2.0			1.0				
4.0		1.3		3.5							
5.0		2.0		8.5							
7.5		2.5		12.0							
Na₃C₆H₅O₇ Citrate		100° (48)		100°							
100° (48)		0.5		1.0							
0.5		1.0		2.0							
1.2		2.0		3.0							
2.0		5.0		6.0							
2.5		7.0		7.0							
3.0		31.0		10.0							
3.5		3.5		12.5							
NaCNS		100° (48)		26.0							
100° (48)		6.0		KCl							
0.5		8.0		20° (26)							
1.5		10.0		30° (20)							
5.0		13.0		70-95° (32)							
6.5		16.0		100° (7, 48)							
9.0		20.0		<i>v. also p. 373</i>							
11.0		24.0		(No apparent							
12.0		0.5		change with temp.)							
13.0		1.0		0.05							
Na₂CrO₄		2.0		0.10							
100° (48)		3.0		0.20							
0.5		5.0		0.50							
3.0		8.0		1.0							
3.5		9.0		1.5							
4.5		11.0		2.0							
Na₂MoO₄		13.5		2.5							
100° (48)		3.0		7.0							
0.7		5.0		7.5							
1.3		8.0		KClO ₃ (47)							
2.0		9.0		65°							
3.0		11.0		0.7							
3.3		13.5		1.3							
4.0		0.5		70°							
Na₂WO₄		3.0		0.8							
100° (48)		8.5		1.2							
0.3		12.0		75°							
0.7		3.0		80°							
1.0		8.5		85°							
1.5		12.0		0.8							
3.5		3.0		1.2							
Na₂W₄O₁₃		5.0		0.8							
100° (48)		8.5		1.2							
0.2		12.0		85°							
0.5		3.0		90°							
1.0		8.5		95°							
		12.0		0.8							
		3.5		1.2							
		8.5		2.48							
		12.0		2.23							
		3.0		0.8							
		8.5		1.2							
		12.0		2.56							
		3.0		2.15							
		8.5		100° (7, 48)							
		12.0		0.5							
		3.0		2.87							

<i>M</i>	100 <i>R</i>
5.0	2.30
10.0	1.92
15.0	1.67
100° (7, 48)	
0.5	3.23
1.0	3.05
2.5	2.71
3.0	2.62
5.0	2.34
10.0	1.96
15.0	1.70
20.0	1.54
24.0	1.44

KH₂PO₄	
100° (48)	
1.0	2.55
2.0	2.24
3.0	2.10
4.0	2.01
5.0	1.92
7.0	1.84

KH₂AsO₄	
100° (48)	
0.8	2.80
1.5	2.55
2.5	2.41
3.5	2.32
4.5	2.27

K₂CO₃ (47, 48)	
30°	
1.5	4.58
3.5	5.40
6.0	6.40
8.0	6.80
40°	
1.5	4.52
3.5	5.36
6.0	6.30
8.0	6.72
50°	
1.5	4.44
3.5	5.30
6.0	6.21
8.0	6.64
60°	
1.5	4.38
3.5	5.22
6.0	6.12
8.0	6.54
70°	
1.5	4.26
3.5	5.10
6.0	5.98
8.0	6.34
80°	
1.5	4.13
3.5	4.92
6.0	5.78
8.0	6.14

<i>M</i>	100 <i>R</i>
90°	
1.5	4.04
3.5	4.82
6.0	5.64
8.0	6.03
100°	
1.5	4.16
3.5	4.78
6.0	5.59
8.0	5.76
10.6	5.2

K₂C₂O₄	
Oxalate	
100° (48)	
0.5	3.67
1.0	3.74
1.5	3.84
2.0	3.96
4.5	4.40

KCHO₂	
Formate	
100° (48)	
1.0	3.10
2.0	3.28
3.0	3.38
4.0	3.45
5.0	3.49
6.0	3.50
8.0	3.50
12.0	3.28
16.0	2.96
21.0	2.65

KC₂H₃O₂	
Acetate	
100° (48)	
1.0	3.32
2.0	3.56
3.0	3.75
4.0	3.90
5.0	4.01
7.0	4.13
9.0	4.10
10.0	4.04
11.0	3.96
20.0	3.16
28.0	2.60

K₂C₃H₂O₄	
Malonate	
100° (48)	
0.75	3.77
1.5	4.48

KC₃H₅O₂	
Propionate	
100° (48)	
1.0	3.25
2.0	3.50
6.0	4.00
8.0	3.91
10.0	3.78
13.0	3.57

KC₄H₇O₂	
Butyrate	
100° (48)	
1.2	3.34
2.0	3.57
4.2	3.74
6.0	3.70
7.0	3.67
11.5	3.44

Isobutyrate	
100° (48)	
2.0	3.42
3.5	3.65
5.5	3.68
7.5	3.61
10.0	3.50
15.0	3.20

KC₅H₉O₂	
Valerate	
100° (48)	
1.5	3.15
2.2	3.26
3.9	3.27
4.2	3.26
9.0	3.09
17.0	2.77

KC₇H₅O₂	
Benzoate	
100° (48)	
1.5	3.21
3.0	3.19
4.0	3.17
5.7	3.13

K₂C₄H₄O₄	
Succinate	
100° (48)	
0.8	4.60
1.6	5.07
2.5	5.51
3.5	5.92
5.0	6.17
5.5	6.10

K₂C₄H₄O₆	
Tartrate	
100° (48)	
1.0	3.90
3.0	4.05
4.5	4.22
9.5	3.86

K₃C₆H₅O₇	
Citrate	
100° (48)	
0.6	4.60
2.0	5.99
2.8	6.39
4.6	6.73
5.0	6.77

KCNS (47)	
40°	
2.0	2.62
5.0	2.95
8.0	2.85

<i>M</i>	100 <i>R</i>
50°	
2.0	2.77
5.0	3.09
8.0	2.98
60°	
2.0	2.92
5.0	3.18
8.0	3.08
70°	
2.0	3.03
5.0	3.22
8.0	3.13
80°	
2.0	3.15
5.0	3.29
8.0	3.19
90°	
2.0	3.25
5.0	3.34
8.0	3.25
100° (48)	
0.8	2.93
1.5	3.21
3.0	3.34
5.0	3.39
8.0	3.32
16.5	2.78
27.0	2.20

KSbOC₄H₄O₆	
Antimonyl tartrate	
100° (48)	
0.4	1.83
0.7	1.83
1.4	1.62

K₄Fe(CN)₆	
100° (48)	
0.2	4.05
0.5	4.33
0.8	4.63
1.2	4.90
1.5	5.13

K₂CrO₄ (47)	
40–50°	
1.3	3.94
2.0	4.19
2.6	4.36
3.6	4.56

1.3	
2.0	4.18
2.6	4.32
3.6	4.51

1.3	
2.0	4.11
2.6	4.26
3.6	4.45

1.3	
2.0	4.03
2.6	4.18
3.6	4.38

<i>M</i>	100 <i>R</i>
90°	
1.3	3.70
2.0	3.94
2.6	4.10
3.6	4.28
100° (48)	
0.6	4.18
0.8	4.02
1.0	3.93
1.4	3.84
1.8	3.82
2.5	4.00
2.8	4.07

K₂MoO₄	
100° (48)	
0.8	3.91
1.6	4.40
2.3	4.75
3.7	5.34
4.7	5.56

K₂WO₄	
100° (48)	
0.6	3.80
1.5	4.52
2.0	4.85
2.5	5.13
3.0	5.36
4.0	5.72
5.0	5.94

RbCl (47, 48)	
<i>v. also p. 374</i>	

50°	
1.5	3.13
3.0	3.33
6.0	3.56

70°	
1.5	3.07
3.0	3.29
6.0	3.54
90°	
1.5	3.03
3.0	3.26
6.0	3.51

100°	
1.5	3.27
3.0	3.35
4.0	3.39
5.0	3.40
10.0	3.26

Rb₂SO₄	
100° (48)	
0.4	3.86
0.7	3.80
1.2	3.69
1.6	3.70
2.4	3.81

RbHSO₄	
100° (48)	
0.5	2.87
1.1	2.89
1.7	2.88
2.4	2.85
5.2	2.73

RbNO₃	
100° (48)	
0.7	2.86
1.4	2.84
2.2	2.75
3.2	2.50
5.8	2.25

CsCl	
<i>t</i> , °C | 100 <i>R</i>	
<i>M</i> = 1.783 (47)	
30	4.05
40	3.95
75	3.47
80	3.42
90	3.37
100	3.36

Three-Component Systems

C₁₂H₂₂O₁₁	
Sucrose	
<i>B</i> = NaCl	
<i>C</i> = H ₂ O	
25° (41)	
ΣM | 100 <i>R</i>	
Mole ratio A/B = 0.0636	
2.2	2.72
2.8	3.22
5.0	3.48

Mole ratio A/B = 0.187	
5.4	3.01
7.0	2.98
Mole ratio A/B = 0.487	
5.4	2.43
6.4	2.56
8.0	2.60

Mole ratio A/B = 0.588	
3.2	2.06
4.4	2.46
6.2	2.25

Mole ratio A/B = 0.918	
2.7	2.04
4.0	2.00
7.9	2.28

Mole ratio A/B = 1.760	
3.0	1.60
4.3	2.21
6.6	2.11

Mole ratio A/B = 3.400	
2.7	2.24
3.8	1.96
5.4	2.42
6.8	2.51

NON-AQUEOUS SOLUTIONS

The quantities appearing in the tables are: $100 x_1$, the mole per cent of the solute; and $k_R = \frac{p_0 - p}{x_1 p_0}$. Within the accuracy of the data the relation between x_1 and k_R is linear between values marked with an arrow, thus $\begin{smallmatrix} 13 \\ 16 \end{smallmatrix} \downarrow$.

Solvent = Br₂ (53)

BrI	
100x ₁	100k _R
2.55	99
S ₂	
4	143
7	105

SnBr₄

8.3	94
8.6	87

SbBr₃

8.7	75
8.9	83

CHBr₃

10.0	97
10.2	103

Solvent = Hg
v. also p. 284

Bi

320–322° (16)

5	77
10	67
20	63.5
35	68.5
50	77
60	82.5
100	100

Sn

305–358° (42)

95	95
97	97

Ti

325° (21, 22)

5	105
10	116
20	121
35	118
50	113
70	107
80	104

Zn (22)

10	93
30	84
40	82
50	83
60	87

Ag

313–320° (16)

0.25	101
------	-----

Au

100x₁ | 100k_R
313–320° (16)

5	55
10	51
20	35

Solvent = NH₃NH₄N₃

–33° (8)

13	181
16	246
17	262
18	275
19	285
20	291

0° (8)

19	231
22	248

Solvent = C₆H₆C₁₀H₈

Naphthalene (38)

0.5	101.9
3	97.5
4	96.4
5	96.0
6	95.9
7	95.9
8	96.1
9	97.1

C₁₄H₁₀

Anthracene (40)

Solvent = CH₃OHC₃H₈O₃

Glycerol

40° (9)

6	82.0
22	63.0
37	61.9
50	69.4
60	76.3
80	86.2
85	89.3

C₁₄H₁₀O₂

Benzil

15° (51)

0.2	84
0.4	85
0.6	86

C₄H₁₂INTetramethyl-
ammonium iodide

100x ₁	100k _R
0.0461	64.3
0.0616	87.6

LiCl

0.5	170
1	173
1.5	176
2	182
2.5	188
3	193
4	198

KI

1.0	164
1.5	165
2.0	167
2.5	169

Solvent = C₂H₅OHC₃H₈O₃

Glycerol

15° (1)

20	44.0
30	45.0
40	46.3
50	48.0
60	51.0
70	56.5
80	66.8
90	80.0

C₇H₆O₂

Benzoic acid

19.5° (54)

2.676 | 95.1

C₁₄H₁₀O₂

Benzil

15° (51)

0.1	98.9
0.2	106.3
0.3	109.6
0.6	100.7

CO(NH₂)₂

Urea

19.0° (54)

2.788 | 107.1

CH₃CONH₂

Acetamide

100x₁ | 100k_R
17.0° (54)

2.811 | 100.8

LiCl

15° (51)

1.5	118
1.8	127
2.2	162
3.8	144
4.0	139

KI

15° (51)

0.17	115.0
0.27	127.5
0.46	127.8

Solvent =

(CH₃)₂CO

Acetone

C₁₈H₃₄O₂

Oleic acid

30° (9)

40	82
60	87
90	95

C₃H₅N₃O₉

Nitroglycerine

100x₁ | 100k_R
18° (28)

10	130
20	154
30	148
40	140
50	131
60	124
70	117
80	111
90	105

v. also p. 288

Solvent = (C₂H₅)₂O

Ethyl ether

H₂SO₄

30° (9)

2	71
19	76
37	175
39	182
52	184

For aqueous

H₂SO₄, v. (55)C₁₈H₃₄O₂

Oleic acid

30° (9)

14	120
100	100

C₆H₇N

Aniline

100x₁ | 100k_R
20° (9)

12	125
18	96
50	87
60	86
70	87
90	93

Solvent = CCl₄C₁₀H₈

Naphthalene

15.5° (54)

1.92 | 107.8

C₁₄H₁₀

Phenanthrene

19.0° (54)

1.85 | 105.0

Solvent = CS₂C₁₈H₃₄O₂

Oleic acid

30° (9)

18	87.5
44	105.0
60	104.8
90	101.2

Solvent = Na₂CO₃

NaCN

v. p. 285

LITERATURE

(For a key to the periodicals see end of volume)

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THE VAPOR PRESSURES OF AQUEOUS SOLUTIONS OF COMMERCIAL ACIDS

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PARTIAL VAPOR PRESSURES OF AQUEOUS SOLUTIONS OF HCl

FRED C. ZEISBERG

 $\log_{10} p_{\text{mm}} = A - B/T$, which, however agrees only approximately with the table. The table is more nearly correct.Partial Pressure of H₂O, mm Hg, °C

% HCl	A	B	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	60°	70°	80°	90°	100°	110°
6	8.99156	2282	4.18	6.04	8.45	11.7	15.9	21.8	29.1	39.4	50.6	66.2	86.0	139	220	333	492	715	
10	8.99864	2295	3.84	5.52	7.70	10.7	14.6	20.0	26.8	35.5	47.0	61.5	80.0	130	204	310	463	677	960
14	8.97075	2300	3.39	4.91	6.95	9.65	13.1	18.0	24.1	31.9	42.1	55.3	72.0	116	185	273	425	625	892
18	8.98014	2323	2.87	4.21	5.92	8.26	11.3	15.4	20.6	27.5	36.4	47.9	62.5	102	162	248	374	550	783
20	8.97877	2334	2.62	3.83	5.40	7.50	10.3	14.1	19.0	25.1	33.3	43.6	57.0	93.5	150	230	345	510	729
22	9.02708	2363	2.33	3.40	4.82	6.75	9.30	12.6	17.1	22.8	30.2	39.8	52.0	85.6	138	211	317	467	670
24	8.96022	2356	2.05	3.04	4.31	6.03	8.30	11.4	15.4	20.4	27.1	35.7	46.7	77.0	124	194	290	426	611
26	9.01511	2390	1.76	2.60	3.71	5.21	7.21	9.95	13.5	18.0	24.0	31.7	41.5	69.0	112	173	261	388	554
28	8.97611	2395	1.50	2.24	3.21	4.54	6.32	8.75	11.8	15.8	21.1	27.9	36.5	60.7	99.0	154	234	349	499
30	9.00117	2422	1.26	1.90	2.73	3.88	5.41	7.52	10.2	13.7	18.4	24.3	32.0	53.5	87.5	136	207	310	444
32	9.03317	2453	1.04	1.57	2.27	3.25	4.55	6.37	8.70	11.7	15.7	21.0	27.7	46.5	76.5	120	184	275	396
34	9.07143	2487	0.85	1.29	1.87	2.70	3.81	5.35	7.32	9.95	13.5	18.1	24.0	40.5	66.5	104	161	243	355
36	9.11815	2526	0.68	1.03	1.50	2.19	3.10	4.41	6.08	8.33	11.4	15.4	20.4	34.8	57.0	90.0	140	212	311
38	9.20783	2579	0.53	0.81	1.20	1.75	2.51	3.60	5.03	6.92	9.52	13.0	17.4	29.6	49.1	77.5	120	182	266
40	9.33923	2647	0.41	0.63	0.94	1.37	2.00	2.88	4.09	5.68	7.85	10.7	14.5	25.0	42.1	67.3	105	158	230
42	9.44953	2709	0.31	0.48	0.72	1.06	1.56	2.30	3.28	4.60	6.45	8.90	12.1	21.2	35.8	57.2	89.2	135	195

Partial Pressure of HCl, mm Hg, °C

% HCl	A	B	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	60°	70°	80°	90°	100°	110°
2	11.8037	4736			0.0000117	0.000023	0.000044	0.000084	0.000151	0.000275	0.00047	0.00083	0.00140	0.00380	0.0100	0.0245	0.058	0.132	0.280
4	11.6400	4471	0.000018	0.000036	0.000069	0.000131	0.00024	0.00044	0.00077	0.00134	0.0023	0.00385	0.0064	0.0165	0.0405	0.095	0.21	0.46	0.93
6	11.2144	4202	0.000066	0.000125	0.000234	0.000425	0.00076	0.00131	0.00225	0.0038	0.0062	0.0102	0.0163	0.040	0.094	0.206	0.44	0.92	1.78
8	11.0406	4042	0.000118	0.000233	0.000583	0.00104	0.00178	0.0031	0.00515	0.0085	0.0136	0.022	0.0344	0.081	0.183	0.39	0.82	1.64	3.10
10	10.9311	3908	0.00042	0.00075	0.00134	0.00232	0.00395	0.0067	0.0111	0.0178	0.0282	0.045	0.069	0.157	0.35	0.73	1.48	2.9	5.4
12	10.7900	3765	0.00099	0.00175	0.00305	0.0052	0.0088	0.0145	0.0234	0.037	0.058	0.091	0.136	0.305	0.66	1.34	2.65	5.1	9.3
14	10.6954	3636	0.0024	0.00415	0.0071	0.0118	0.0196	0.0316	0.050	0.078	0.121	0.185	0.275	0.60	1.25	2.50	4.8	9.0	16.0
16	10.6261	3516	0.0056	0.0095	0.016	0.0265	0.0428	0.0685	0.106	0.163	0.247	0.375	0.55	1.17	2.40	4.66	8.8	16.1	28
18	10.4957	3376	0.0135	0.0225	0.037	0.060	0.095	0.148	0.228	0.345	0.515	0.77	1.11	2.3	4.55	8.6	15.7	28	48
20	10.3833	3245	0.0316	0.052	0.084	0.132	0.205	0.32	0.48	0.72	1.06	1.55	2.21	4.4	8.5	15.6	28.1	49	83
22	10.3172	3125	0.0734	0.119	0.187	0.294	0.45	0.68	1.02	1.50	2.18	3.14	4.42	8.6	16.3	29.3	52	90	146
24	10.2185	2995	0.175	0.277	0.43	0.66	1.00	1.49	2.17	3.14	4.5	6.4	8.9	16.9	31.0	54.5	94	157	253
26	10.1303	2870	0.41	0.64	0.98	1.47	2.17	3.20	4.56	6.50	9.2	12.7	17.5	32.5	58.5	100	169	276	436
28	10.0115	2732	1.0	1.52	2.27	3.36	4.90	7.05	9.90	13.8	19.1	26.4	35.7	64	112	188	309	493	760
30	9.8763	2593	2.4	3.57	5.23	7.60	10.6	15.1	21.0	28.6	39.4	53	71	124	208	340	542	845	
32	9.7523	2457	5.7	8.3	11.8	16.8	23.5	32.5	44.5	60.0	81	107	141	238	390	623	970		
34	9.6061	2316	13.1	18.8	26.4	36.8	50.5	68.5	92	122	161	211	273	450	720				
36	9.6262	2229	29.0	41.0	56.4	78	105.5	142	188	246	322	416	535	860					
38	9.4670	2094	63.0	87.0	117	158	210	277	360	465	598	758	955						
40	9.2156	1939	130	176	233	307	399	515	627	830									
42	8.9925	1800	253	332	430	560	709	900											
44	8.8621	1681	510	655	840														
46		1940																	

Accuracy, ca. 2 % for solutions of 15 to 30 % HCl between 0 and 100°; for solutions of >30 % HCl the accuracy is ca. 5 % at the lower temperatures and ca. 15 % at the higher temperatures. Below 15 % HCl, the accuracy is ca. 5 % at the lower temperatures and higher strengths to ca. 15–20 % at the lower strengths and perhaps 15–20 % at the higher temperatures and lower strengths. The above table is practically based upon the data of (2, 6, 9, 10, 13, 15), the data of other observers being discordant. The new data by Klemenc and Nagel (11) at 12.5°C were not available for consideration at the time the table was prepared.

LITERATURE

(For a key to the periodicals see end of volume)

- (1) Allan, 50, 2: 120; 98. (2) Bates and Kirschman, 1, 41: 1991; 19. (3) Bineau, 6, 7: 257; 43. (4) Dobson and Musson, 4, 125: 668; 24. (5) Dolezalek, 7, 26: 321; 98. (6) Dunn and Rideal, 4, 125: 676; 24. (7)

- Foult and Hollingsworth, 1, 45: 1220; 23. (8) Gahl, 7, 33: 178; 00. (9) Harned, 1, 44: 252; 22. (10) Hulett and Bonner, 1, 31: 390; 09. (11) Klemenc and Nagel, 93, 155: 257; 26. (12) Roscoe, 13, 116: 203; 60. (13) Roscoe and Dittmar, 13, 112: 327; 59. (14) Vrevskii, 53, 42: 1349; 10. (15) Vrevskii, Zavarickii, and Sharlov, 53, 54: 360; 23. (16) Yannakis, 34, 177: 174; 23

PARTIAL VAPOR PRESSURES OF AQUEOUS SOLUTIONS OF SULFUR DIOXIDE

W. B. VAN ARSDEL

Partial Pressures of H₂O and SO₂, mm Hg, °C*v. also p. 258*

Grams SO ₂ per 100 g water	10°C		20°C		30°C		40°C		50°C		60°C		70°C			
	H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂		
0.0	9.2		17.5		31.8		55.3		92.5		149.5		234			
0.5	9.2	21	17.5	29	31.7	42	55.2	60	92.3	83	149.2	111	234	144		
1.0	9.2	42	17.4	59	31.7	85	55.1	120	92.2	164	149.0	217	233	281		
1.5	9.2	64	17.4	90	31.6	129	55.0	181	92.0	247	148.8	328	233	426		
2.0	9.1	86	17.4	123	31.6	176	55.0	245	91.9	333	148.6	444	233	581		
2.5	9.1	108	17.4	157	31.5	224	54.9	311	91.8	421	148.3	562	232	739		
3.0	9.1	130	17.3	191	31.5	273	54.7	378	91.6	511	148.1	682	232	897		
3.5	9.1	153	17.3	227	31.5	324	54.7	447	91.5	603	147.9	804				
4.0	9.1	176	17.3	264	31.4	376	54.6	518	91.4	698						
4.5	9.1	199	17.3	300	31.4	428	54.5	588	91.2	793						
5.0	9.1	223	17.2	338	31.3	482	54.4	661								
5.5	9.0	247	17.2	375	31.3	536	54.4	733								
6.0	9.0	271	17.2	411	31.2	588	54.3	804								
6.5	9.0	295	17.2	448	31.2	642										
7.0	9.0	320	17.1	486	31.1	698										
7.5	9.0	345	17.1	524	31.1	752										
8.0	9.0	370	17.1	562	31.0	806										
8.5	9.0	395	17.0	600												
9.0	9.0	421	17.0	638												
9.5	8.9	447	17.0	676												
10.0	8.9	473	17.0	714												
10.5	8.9	499	17.0	751												
11.0	8.9	526	16.9	789												
11.5	8.9	553	Grams SO ₂ per 100 g water		80°C		90°C		100°C		110°C		120°C		130°C	
12.0	8.9	580			H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂	H ₂ O	SO ₂
12.5	8.9	608														
13.0	8.8	635	0.0		355		526		760		1074		1488		2026	
13.5	8.8	662	0.5		354	182	525	225	758	274	1072	326	1486	377	2024	420
14.0	8.8	689	1.0		354	356	524	445	757	548	1071	661	1484	775	2022	879
14.5	8.8	716	1.5		353	543	523	684	756	850	1070	1032				
15.0	8.8	743	2.0		353	746	523	940								
15.5	8.8	771	2.5		352	956										
16.0	8.8	799														

The above table is based upon the data of the following observers, the weight assigned to each being indicated: Schoenfeld, 0; Sims, 3; Smith-Parkhurst, 4; Freese, 0; Öman, 3; Enckell, 3; Hudson, 5; Taylor, 2; and Taylor and Chase, 4. The partial pressure of water was calculated using Fulda's values for the ionization constant of H₂SO₃.

LITERATURE

(For a key to the periodicals see end of volume)

- (1) Enckell, *Papp. trav. tids. Finland*, No. 4: 93; 25. 472, 23: 633; 25. (2) Freese, 491, 51: 861; 20. (3) Fulda, 291, 30: 81; 09. (4) Hudson, 4,

- 127: 1332; 25. (5) Öman, 485, 54: 81; 24. (6) Scheel and Heuse, 8, 31 715; 10. (7) Schönfeld, 13, 95: 1; 55. (8) Sims, 4, 14: 1; 62. (9) Smith and Parkhurst, 1, 44: 1918; 22. (10) Taylor, Research Dept., The Brown Co., Berlin, New Hampshire, 0. (11) Taylor and Thing, Research Dept., The Brown Co., Berlin, New Hampshire, 0. (12) Taylor and Chase, The Brown Co., Berlin, N. H., 0.

VAPOR PRESSURES, NORMAL BOILING POINTS, AND LATENT HEATS OF VAPORIZATION FOR AQUEOUS SOLUTIONS OF H₂SO₄

FRANK C. BLAKE AND C. H. GREENEWALT

% = Wt. % H₂SO₄ in the solution.A and B are constants in the equation $\log_{10} p_{\text{mm}} = A - B/T$ l = total heat of vaporization in g-cal₁₈ per g of water evaporated.

B. P. = normal boiling point, °C.

For bibliography and discussion of data, *v. Greenewalt*, 45, 17: 522; 25.

% =	95	90	85	80	75	70	65	60	55	50	45	40	35	30	25	20	10
A =	9.790	9.255	9.239	9.293	9.034	9.032	8.853	8.841	8.827	8.832	8.809	8.844	8.873	8.864		8.922	8.925
B =	3888	3390	3175	3040	2810	2688	2533	2458	2400	2357	2322	2299	2286	2271		2268	2259
l =	987	861	806	772	713	682	643	624	609	598	590	584	580	577		576	574
B. P. =	290	255	225	202	182	165	151	140	130	123	118	114	110	108	106	104	102
°C	Total vapor pressure, mm Hg																
0			0.00418	0.0144	0.0550	0.154	0.377	0.686	1.08	1.55	2.07	2.55	3.06	3.43	3.72	4.02	4.38
5		0.00118	0.00680	0.0230	0.0867	0.235	0.558	1.03	1.60	2.26	2.99	3.69	4.40	4.94	5.33	5.87	6.30
10		0.00196	0.0108	0.0358	0.128	0.342	0.800	1.46	2.26	3.19	4.19	5.22	6.23	6.91	7.46	8.05	8.80
15		0.00318	0.0169	0.0555	0.195	0.506	1.15	2.05	3.19	4.50	5.85	7.27	8.65	9.65	10.5	11.3	12.3
20		0.00497	0.0257	0.0835	0.284	0.723	1.61	2.87	4.43	6.20	8.10	9.95	11.8	13.2	14.3	15.4	16.6
25		0.00765	0.0390	0.124	0.408	1.03	2.24	3.97	6.15	8.45	10.9	13.5	15.8	17.8	19.4	20.8	22.4
30		0.0117	0.0585	0.183	0.580	1.44	3.09	5.41	8.29	11.3	14.7	18.0	21.2	23.8	26.0	27.8	30.0
35	0.00150	0.0179	0.0860	0.265	0.822	2.00	4.23	7.39	11.2	15.4	19.7	24.3	28.6	31.9	35.0	37.2	40.1
40	0.00235	0.0265	0.125	0.381	1.14	2.75	5.66	9.85	14.8	20.3	26.0	31.8	37.3	41.7	45.6	48.6	52.9
45	0.00370	0.0395	0.181	0.540	1.57	3.73	7.60	13.0	19.5	26.7	33.0	41.0	48.6	54.7	59.0	63.3	68.1
50	0.00580	0.0580	0.260	0.770	2.20	5.17	10.2	17.5	26.0	35.2	44.7	53.9	63.0	71.3	76.7	82.2	88.5
55	0.00877	0.0840	0.367	1.06	2.95	6.89	13.4	22.7	33.7	45.5	57.5	69.0	80.2	91.0	98.2	106	113
60	0.0133	0.120	0.411	1.47	3.98	9.12	18.6	29.3	43.0	58.0	73.0	87.3	102	116	124	133	143
65	0.0196	0.169	0.707	2.00	5.30	10.2	22.7	37.7	55.1	73.7	92.3	110	127	145	156	167	178
70	0.0288	0.236	0.960	2.68	7.02	15.6	29.0	48.0	69.6	92.5	116	138	159	180	195	207	223
75	0.0415	0.327	1.31	3.60	9.26	20.3	37.0	60.2	87.0	115	144	171	198	222	240	256	274
80	0.0606	0.450	1.77	4.77	12.0	26.0	47.0	75.3	108	143	179	211	244	273	295	314	337
85	0.0879	0.618	2.37	6.35	15.6	33.4	59.7	94.3	136	178	211	261	300	333	360	385	413
90	0.123	0.823	3.14	8.30	20.0	42.5	74.6	117	167	217	271	319	369	404	437	468	498
95	0.172	1.12	4.18	10.8	25.7	53.9	92.7	144	205	268	335	390	450	493	531	580	608
100	0.237	1.49	5.39	13.9	32.0	67.0	114	178	253	326	405	474	540	590	637	678	720
105	0.321	1.93	6.95	17.6	40.0	82.3	140	213	302	393	484	568	642	702	758	812	
110	0.437	2.52	9.00	22.5	50.0	103	172	260	367	471	580	679	768				
115	0.590	3.23	11.4	28.3	62.0	126	207	313	435	562	684	800					
120	0.788	4.19	14.5	35.6	76.5	153	251	377	522	670	812						
125	1.07	5.43	18.3	44.7	94.5	188	304	452	625	797							
130	1.42	6.97	23.2	56.0	117	230	370	544	744								
135	1.87	8.85	29.1	69.0	142	277	440	647									
140	2.40	11.2	36.3	85.5	173	332	525	760									
145	3.11	13.9	44.3	104	208	397	622										
150	4.02	17.5	54.6	127	248	471	730										
155	5.13	21.9	68.2	157	299	564											
160	6.47	27.7	82.0	188	354	665											
165	8.39	33.2	99.5	226	422	790											
170	10.3	39.8	119	267	496												
175	12.9	48.4	143	319	585												
180	15.9	59.0	169	378	685												
185	20.2	71.2	206	450	810												
190	24.8	85.0	245	535													
195	30.7	102	291	637													
200	36.7	120	340	735													
205	45.3	143	402														
210	55.0	170	472														
215	66.9	203	557														
220	79.8	240	647														
225	95.5	279	750														
230	115	326															
235	137	380															
														°C		95 %	90 %
														240		164	450
														245		193	520
														250		229	604
														255		268	700
														260		314	800
														265		363	
														270		430	
														275		500	
														280		580	
														285		682	
														290		790	

The Partial Pressure of SO_3 above Fuming Sulfuric Acid, mm Hg, °C

Total H ₂ SO ₄	% SO ₃	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
102%	83.265				0.4	0.6	1.0	1.6	2.5	3.8	5.7	8.5	12.5	18.2	26.3	37.5
103.0	84.081				0.5	0.9	1.3	2.1	3.2	4.8	6.8	10.5	15.3	22.0	31.4	44.4
104.0	84.897	0.2	0.3	0.5	0.8	1.3	2.0	3.0	4.5	6.7	9.8	14.2	20.4	29.0	40.8	56.8
104.5	85.305	0.3	0.4	0.7	1.1	1.7	2.6	4.0	6.0	8.9	12.9	18.8	26.7	37.9	53.5	73.9
105.0	85.714	0.4	0.7	1.1	1.7	2.6	4.0	6.0	9.0	13.1	19.0	27.2	38.6	54.1	75.2	103.7
105.5	86.122	0.8	1.2	1.9	2.9	4.4	6.6	9.8	14.3	20.7	29.5	42.1	58.1	81.5	112.6	153.1
106.0	86.530	1.4	2.1	3.2	4.9	7.3	10.8	15.7	22.6	32.1	45.2	63.0	87.0	119.0	161.5	217.2
106.5	86.938	2.4	3.6	5.5	8.2	12.0	17.4	25.0	35.4	49.8	69.0	95.5	129.3	171.2	230.1	311.9
107.0	87.346	4.0	6.0	8.9	13.0	18.8	26.9	38.1	53.4	74.0	101.6	138.2	186.4	249.2	330.5	434.9
107.5	87.754	6.9	10.0	14.6	20.7	29.2	40.7	56.4	77.1	104.6	140.2	167.3	246.5	323.7	422.2	547.7
108.0	88.163		15.9	22.4	31.4	43.4	59.4	80.6	108.3	144.2	190.4	249.4	324.2			
108.5	88.571			35.1	47.8	64.8	86.9	115.7	152.3	199.4	257.9	333.6	425.1			
109.0	88.979				64.5	86.6	115.3	152.1	199.0	258.3	332.5	425.0	539.5			
110.0	89.795				100.5	133.7	176.1	230.1	298.2	383.5	489.5					
111.0	90.612			105.2	140.5	185.7	243.4	316.3	407.9							
112.0	91.428	76.1	103.2	138.5	184.0	242.4	316.5	409.9	526.6							
113.0	92.244	96.9	130.9	175.1	232.1	304.9	397.1	512.9	657.4							
114.0	93.060	119.1	160.7	214.9	284.5	373.3	485.8	626.9	802.8							
115.0	93.877	144.2	194.3	259.2	342.6	448.8	583.0	751.2	960.4							

Unpublished determinations from the Eastern Laboratory of E. I. du Pont de Nemours & Company.

The Partial Pressures of H_2SO_4 and H_2O over Sulfuric Acid Solutions[illegible]

Measurements by Thomas and Barker, 4, 127: 2824; 25. p in mm Hg. Accuracy, 5 to 15%.

PARTIAL VAPOR PRESSURES OF AQUEOUS SOLUTIONS OF HNO_3 , MM Hg

G. B. TAYLOR

Based chiefly upon the data of Creighton and Githens, Carpenter and Babor, Burdick and Freed, Sproesser and Taylor, Pascal, and Klemenc

Percentages are Wt. % HNO_3 in solution

[illegible]

°C	40%		45%		50%		55%		60%	
	HNO ₃	H ₂ O	HNO ₃	H ₂ O	HNO ₃	H ₂ O	HNO ₃	H ₂ O	HNO ₃	H ₂ O
0		3.0		2.6		2.1		1.8	0.19	1.5
5		4.2		3.6		3.0	0.14	2.5	0.28	2.1
10		5.8		5.0	0.12	4.2	0.21	3.5	0.41	3.0
15		8.0	0.10	6.9	0.18	5.8	0.31	4.9	0.59	4.1
20		10.8	0.15	9.4	0.27	7.9	0.45	6.7	0.84	5.6
25	0.12	14.6	0.23	12.7	0.39	10.7	0.66	9.1	1.21	7.7
30	0.17	19.5	0.33	16.9	0.56	14.4	0.93	12.2	1.66	10.3
35	0.25	25.5	0.48	22.3	0.80	19.0	1.30	16.1	2.28	13.6
40	0.36	33.5	0.68	29.3	1.13	25.0	1.82	21.3	3.10	18.1
45	0.52	43	0.96	38.0	1.57	32.5	2.50	28	4.20	23.7
50	0.75	56	1.35	49.5	2.18	42.5	3.41	36.3	5.68	31.0
55	1.04	71	1.83	62.5	2.95	54	4.54	46.0	7.45	39
60	1.48	90	2.54	80	4.05	70	6.15	60	9.9	51
65	2.05	114	3.47	100	5.46	88	8.18	76	13.0	64
70	2.80	143	4.65	126	7.25	110	10.7	95	16.8	81
75	3.80	178	6.20	158	9.6	138	13.9	120	21.8	102
80	5.10	218	8.15	195	12.5	170	18.0	148	27.5	126
85	6.83	268	10.7	240	16.3	211	23.0	182	34.8	156
90	9.0	325	13.7	292	20.9	258	29.4	223	43.7	192
95	11.7	394	17.8	355	26.8	315	37.3	272	55.0	233
100	15.5	480	23.0	430	34.2	383	47	331	69.5	285
105	20.0	573	29.2	520	43.0	463	58.5	400	84.5	345
110	25.7	688	37.0	625	54.5	560	73	485	103	417
115	32.5	810	46	740	67	665	90	575	126	495
120					84	785	110	685	156	590
125									187	700

°C	65%		70%		80%		90%		100%
	HNO ₃	H ₂ O	HNO ₃	H ₂ O	HNO ₃	H ₂ O	HNO ₃	H ₂ O	HNO ₃
0	0.41	1.3	0.79	1.1	2		5.5		11
5	0.60	1.8	1.12	1.6	3		8		15
10	0.86	2.6	1.58	2.2	4	1.2	11		22
15	1.21	3.5	2.18	3.0	6	1.7	15		30
20	1.68	4.9	3.00	4.1	8	2.4	20		42
25	2.32	6.6	4.10	5.5	10.5	3.2	27	1	57
30	3.17	8.8	5.50	7.4	14	4	36	1.3	77
35	4.26	11.6	7.30	9.8	18.5	5.5	47	1.8	102
40	5.70	15.5	9.65	12.8	24.5	7	62	2.4	133
45	7.55	20.0	12.6	16.7	32	9.5	80	3	170
50	10.0	26.0	16.5	21.8	41	12	103	4	215
55	12.8	33.0	21.0	27.3	52	15	127	5	262
60	16.8	43.0	27.1	35.3	67	20	157	6.5	320
65	21.7	54.5	34.5	44.5	85	25	192	8	385
70	27.5	68	43.3	56	106	31	232	10	460
75	35.0	86	54.5	70	130	38	282	13	540
80	43.5	106	67.5	86	158	48	338	16	625
85	54.5	131	83	107	192	60	405	20	720
90	67.5	160	103	130	230	73	480	24	820
95	83.5	195	125	158	278	89	570	29	
100	103	238	152	192	330	108	675	35	
105	124	288	183	231	392	129	790	42	
110	152	345	221	270	465	155			
115	181	410	262	330	545	185			
120	218	490	312	393	640	219			
125	260	580	372	469					

LITERATURE

(For a key to the periodicals see end of volume)

- (¹) Berl and Samtleben, *92*, **35**: 201; 22. (²) Burdick and Freed, *1*, **43**: 518; 21. (³) Carpenter and Babor, *79*, **16 I**: 111; 25. (⁴) Creighton and Githens, *143*, **179**: 161; 15. (⁵) Klemenc and Nagel, *93*, **155**: 257; 26. (⁶) Pascal, *315*, **20**: 40; 23. (⁷) Roscoe, *4*, **13**: 146; 61. (⁸) Sapozhnikov, *7*, **53**: 225; 05. (⁹) Sproesser and Taylor, *1*, **43**: 1782; 21.

THE VAPOR PRESSURES OF AQUEOUS SOLUTIONS OF CH_3COOH , HBr AND HI

C. H. GREENEWALT

TOTAL VAPOR PRESSURE OF ACETIC ACID—WATER MIXTURES
(MM HG)

% = Wt. % acetic acid in the solution. Based upon the data of Kahlbaum (2) and Konowalow (3)

C°	%	25	50	75
20		16.3	15.7	15.3
25		22.1	21.4	20.8
30		29.6	28.8	27.8
35		39.4	38.3	36.6
40		51.7	50.2	48.1
45		67.0	65.0	62.0
50		87.2	85.0	80.1
55		110	107	102
60		141	138	130
65		178	172	162
70		223	216	203
75		277	269	251
80		342	331	310
85		419	407	376
90		510	497	458
95		618	602	550
100		743	725	666

AQUEOUS SOLUTIONS OF HBr , p_{mm} at 25°C (1)

% HBr	p_{HBr}	% HBr	p_{HBr}	% HBr	p_{HBr}
32	0.0016	38	0.0061	44	.048
34	.0022	40	.011	46	.10
36	.0033	42	.023		

PARTIAL PRESSURES OF H_2O AND HBr (MM HG) (4)

% HBr	20°C		25°C		50°C		55°C	
	HBr	H_2O	HBr	H_2O	HBr	H_2O	HBr	H_2O
48	0.09	6.2	0.13	8.2	1.3	30.2	2.0	38
50	0.23	4.5	0.37	6.1	3.2	24.3	4.6	31
52	0.71	3.3	1.1	4.5	7.2	19.3	10.2	25
54	2.2	2.4	3.2	3.3	17	16.0	23.0	21
56	6.8	1.7	9.3	2.4	40	13.3	51	18
58	21	1.3	27	1.9	91	10.4	115	14
60							260	11.4

PARTIAL PRESSURE OF HI OVER AQUEOUS SOLUTIONS OF HI , 25°C
(MM HG) (1)

% HI	44	46	48	50	52	54	56
p_{HI}	0.00064	0.0010	0.0022	0.0050	0.013	0.035	0.10

LITERATURE

(For a key to the periodicals see end of volume)

(1) Bates and Kirschman, *I*, **41**: 1991; 19. (2) Kahlbaum, *7*, **13**: 14; 94. (3) Konowalow, *8*, **14**: 34; 81. (4) Vrevskii, Zavarickii and Sharlov, *53*, **54**: 360; 23.VAPOR PRESSURES, BOILING POINTS AND VAPOR COMPOSITIONS FOR THE SYSTEM H_2O — H_2SO_4 — HNO_3

F. C. ZEISBERG

The available information is summarized and presented below in graphical form. The small circles on the left-hand sides of Figs. 2 and 3 are the critical values for the system H_2O — HNO_3 as given above (p. 304). They show that the best available data for the ternary system are inconsistent with the best data for the binary system.

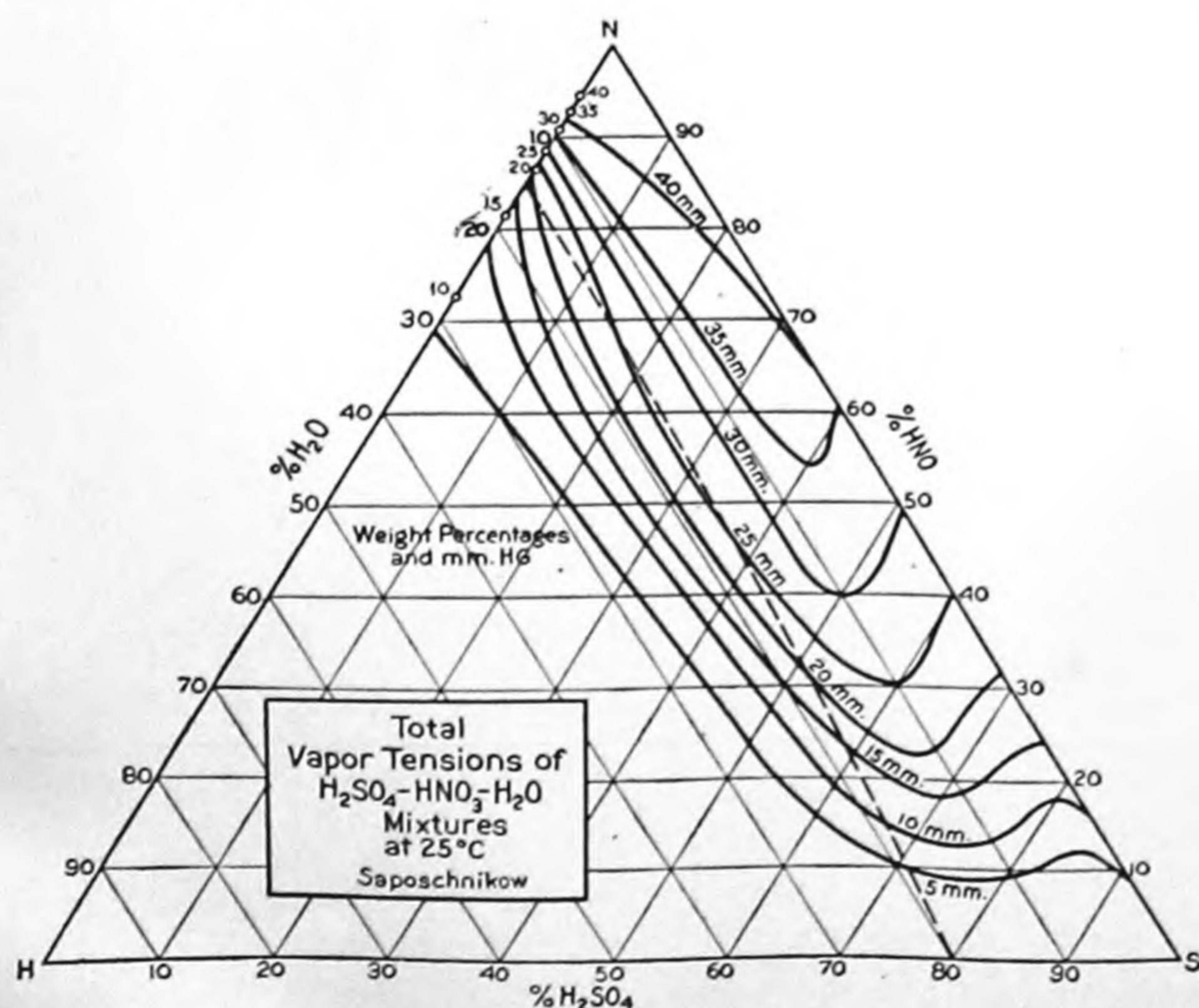


FIG. 2.

LITERATURE

(For a key to the periodicals see end of volume)

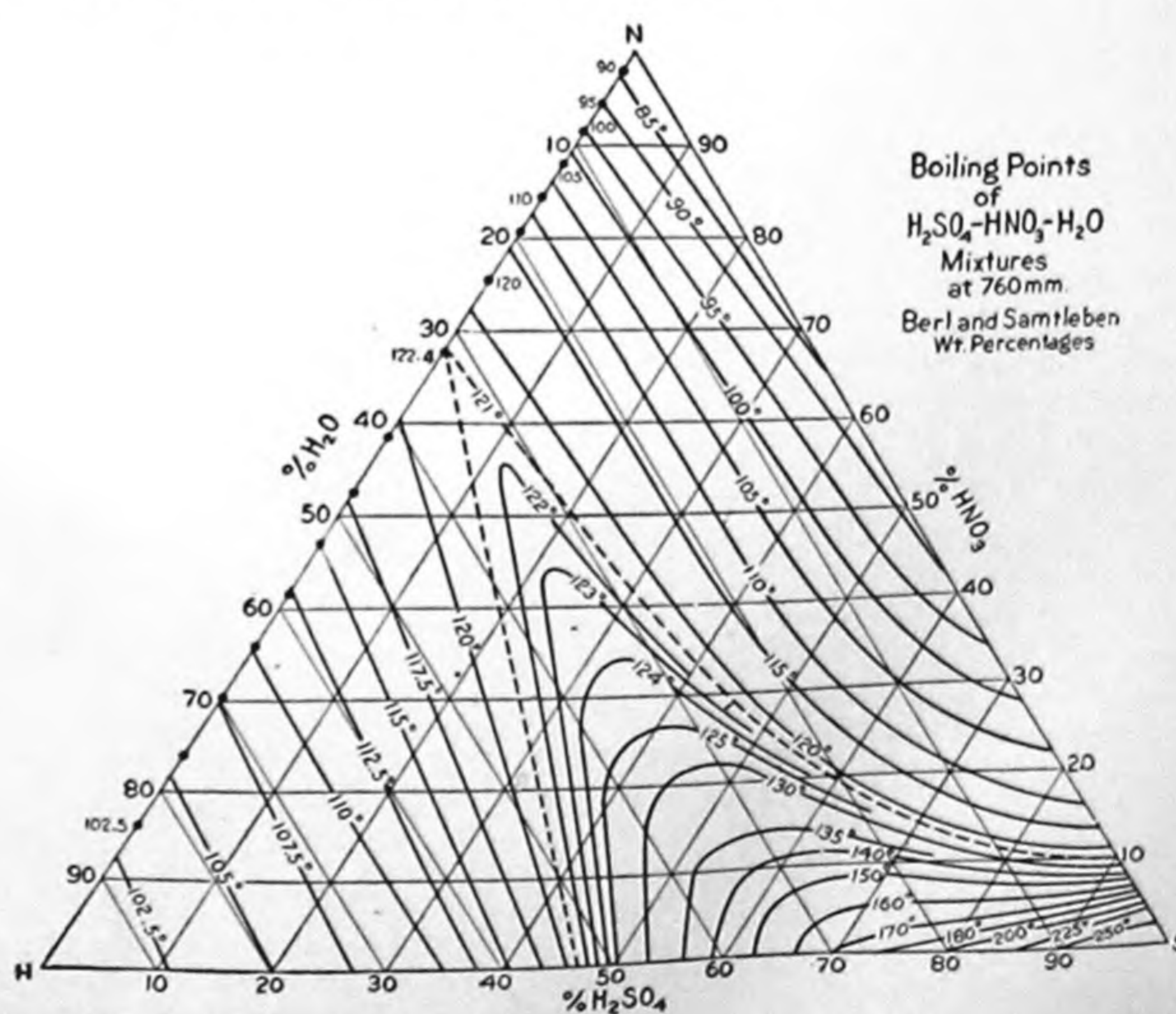
(1) Berl and Samtleben, *92*, **35**: 206; 22. (2) Carpenter and Babor, *79*, **16 I**: 111; 25. (3) Creighton and Smith, *143*, **180**: 703; 15. (4) Pascal and Garnier, *14*, **15**: 253; 21. (5) Sapozhnikov, *7*, **49**: 697; 04. **51**: 609; 05. **53**: 225; 05. (6) Sapozhnikov, *245*, **4**: 441, 462; 09.

FIG. 3.

FIG. 1.

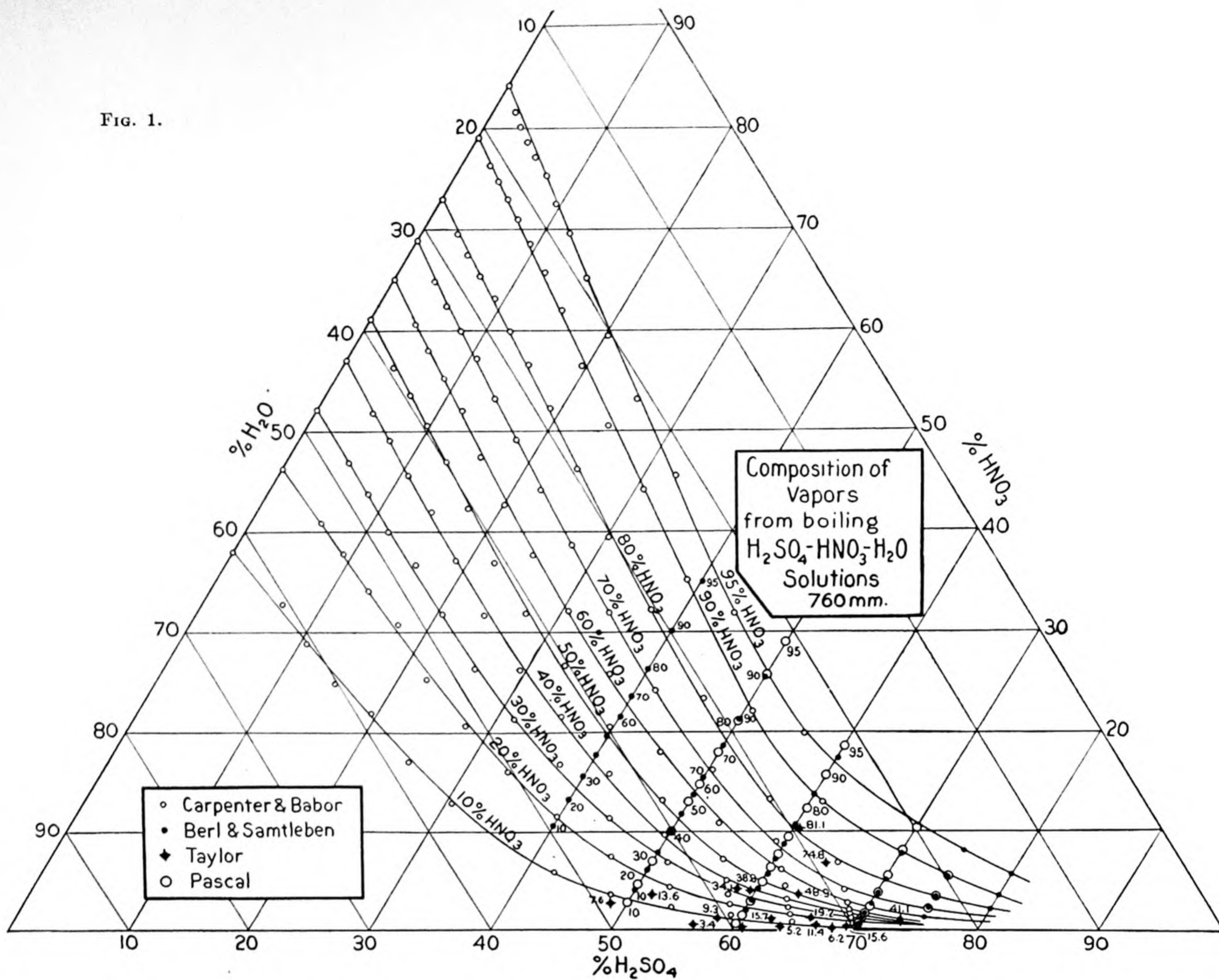


FIG. 4.

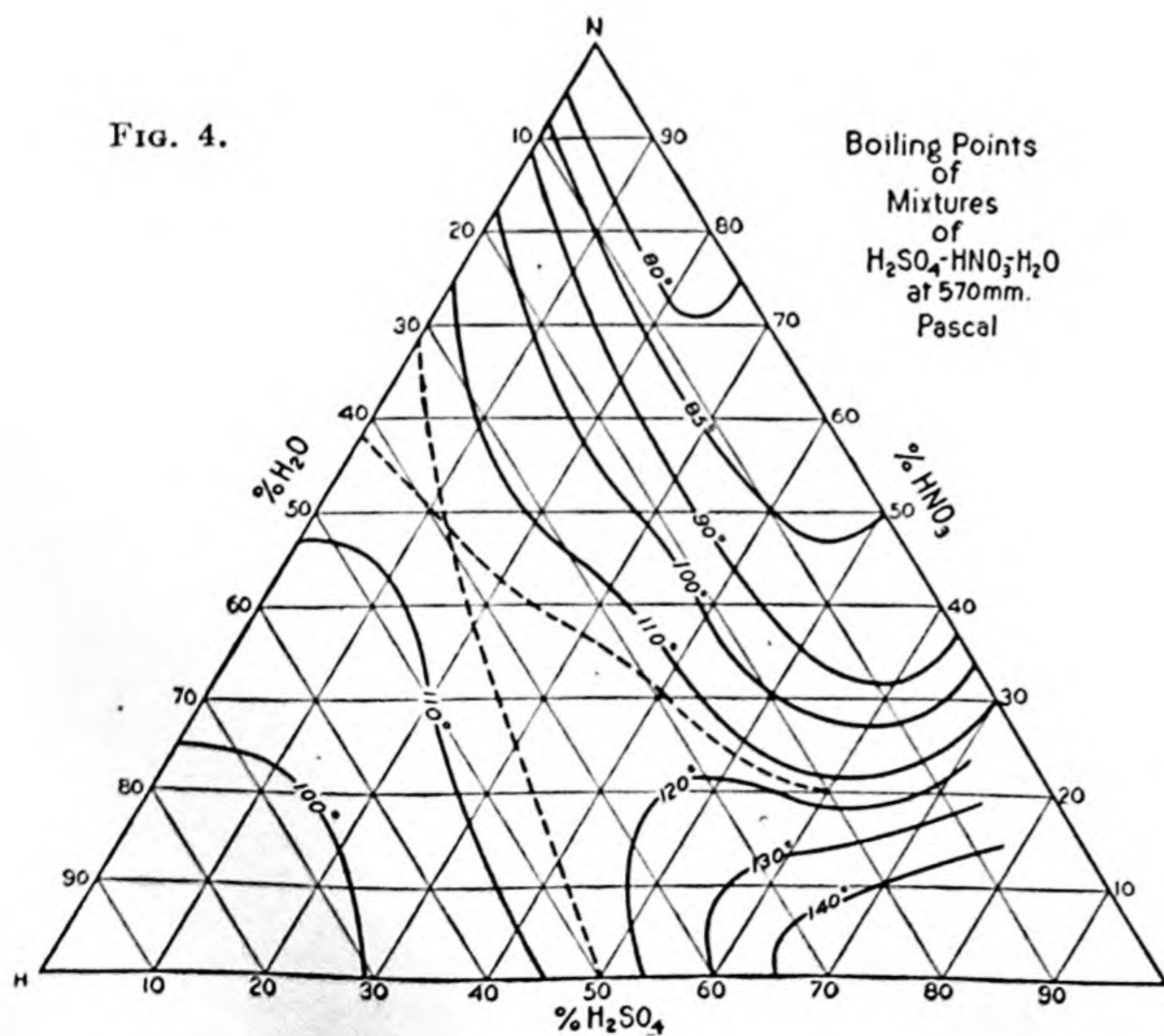


FIG. 5.

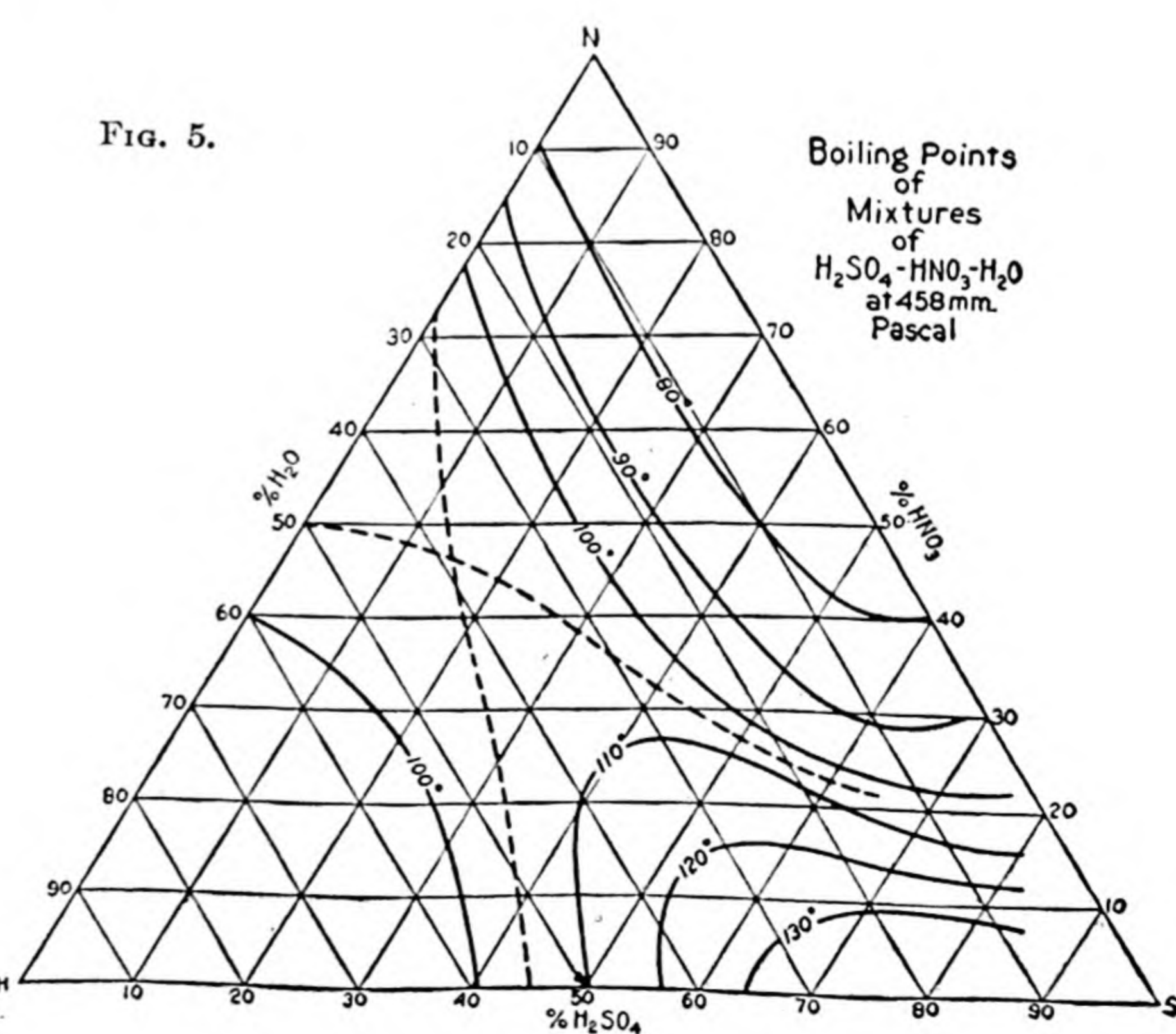


FIG. 6.

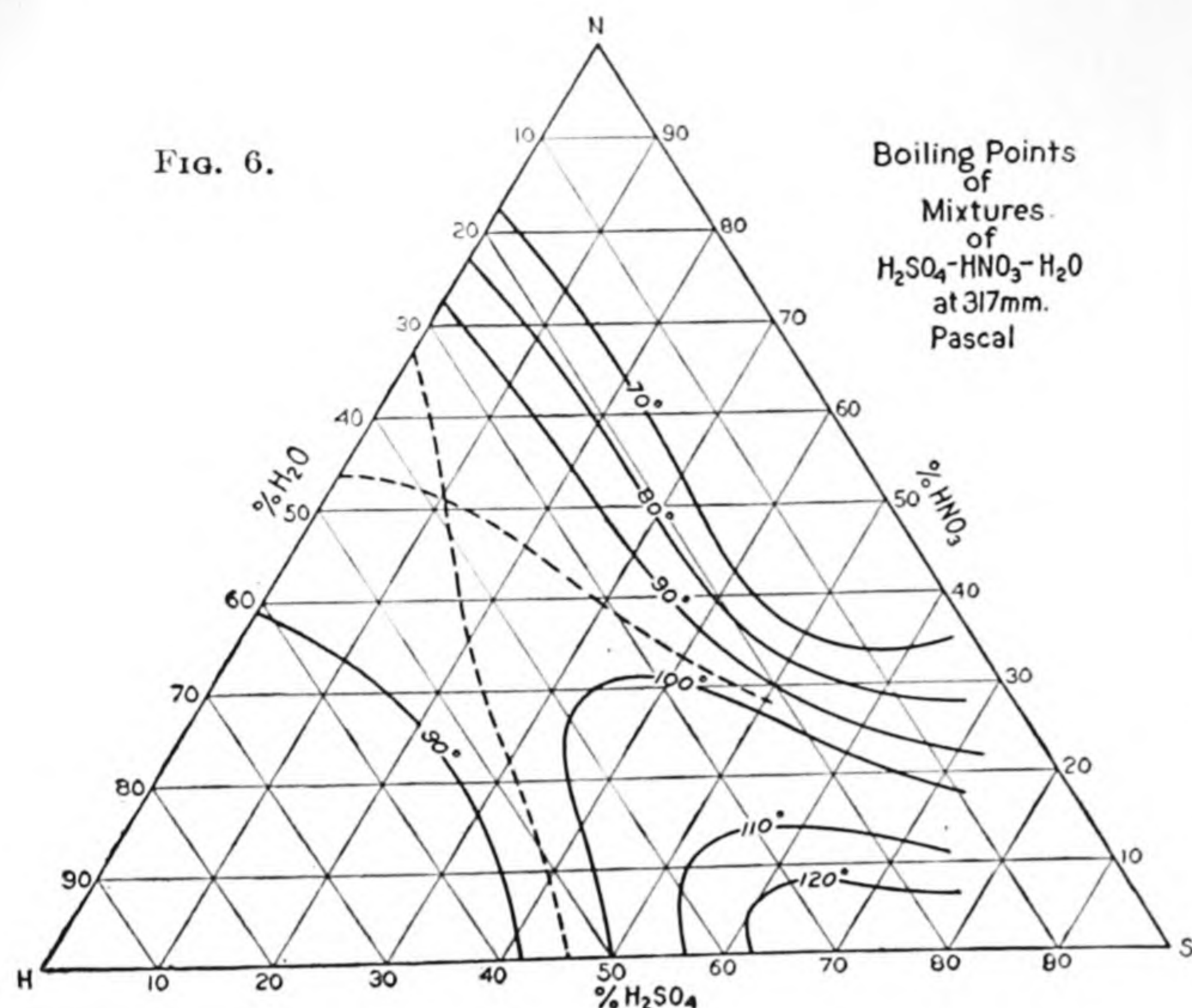


FIG. 7.

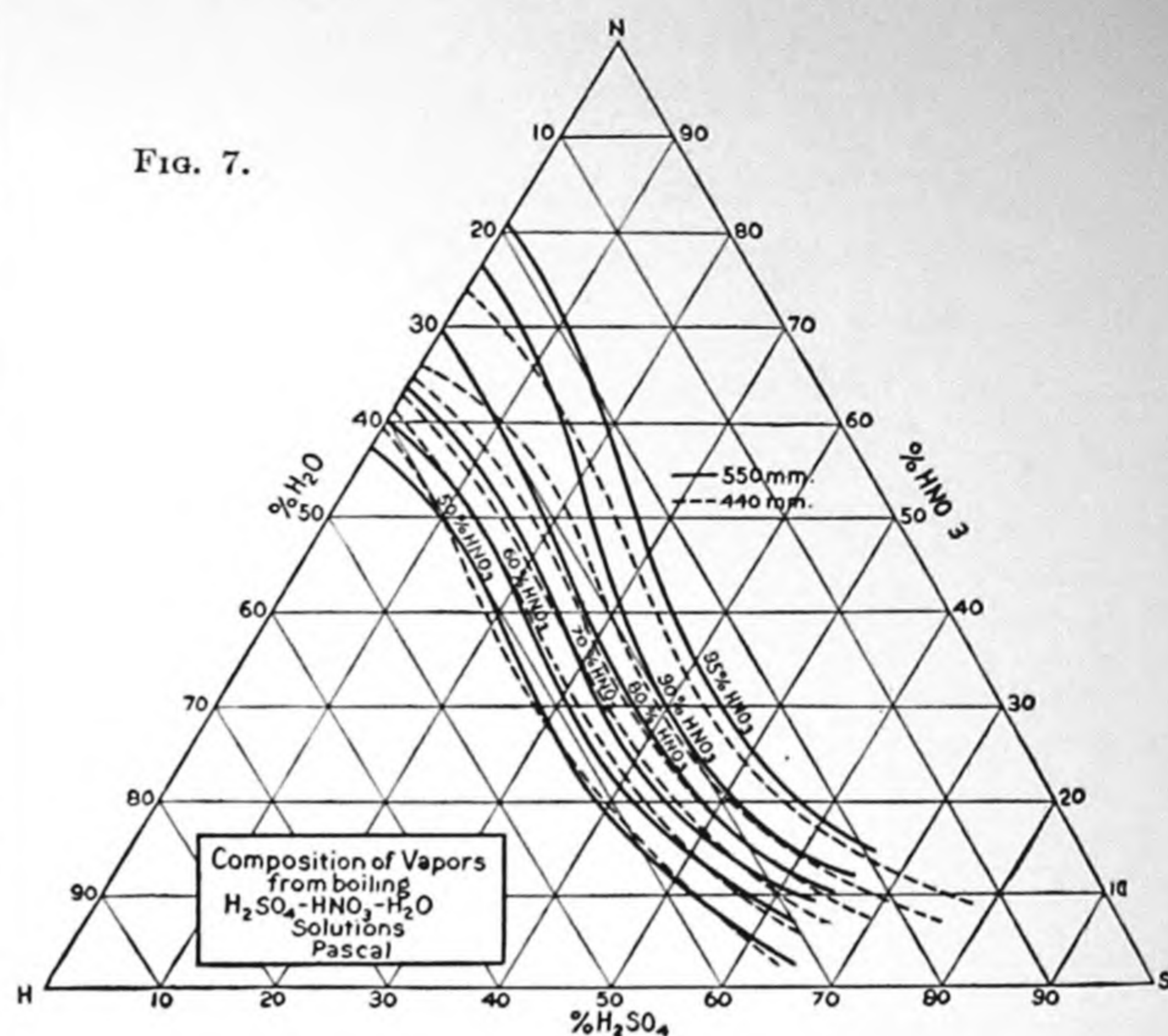
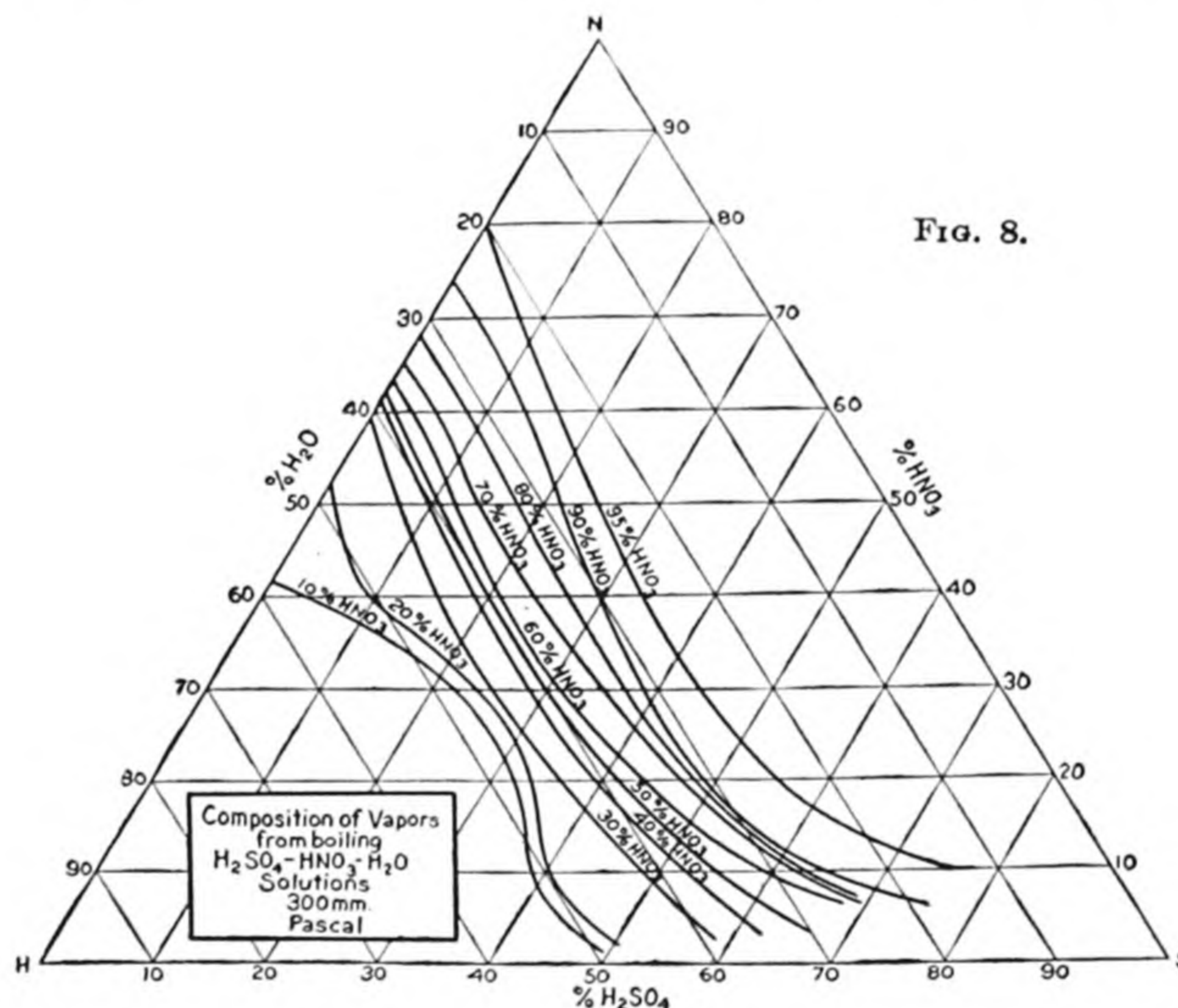


FIG. 8.



VARIATION OF BOILING POINT WITH COMPOSITION, FOR LIQUID MIXTURES OF VOLATILE CONSTITUENTS

D. B. KEYES, ASSISTED BY D. B. MASON AND ROGER K. TAYLOR

CONTENTS

Two-component systems.
Three-component systems.
Azeotropic mixtures.

ABBREVIATIONS

B. P. Boiling point.
M % Mole %. (In the liquid unless otherwise indicated.)
↓ Linear relation over the range so marked.
Maximum or minimum boiling points in bold-face type.

MATIÈRES

Systèmes à deux constituants.
Systèmes à trois constituants.
Mélanges azéotropiques.

ABRÉVIATIONS

B. P. Point d'ébullition.
M % Pourcent moléculaire. (Dans le liquide à moins d'une autre indication.)
↓ Relation linéaire pour tout l'intervalle ainsi désigné.
Points d'ébullition maximum et minimum en caractères gras.

INHALTSVERZEICHNIS

Zweikomponenten Systeme.
Dreikomponenten Systeme.
Azeotropische Mischungen.

ABKÜRZUNGEN

B. P. Siedepunkt.
M % Mol-Prozente. (In der Flüssigkeit, wenn nichts anderes angegeben.)
↓ Gibt den Bereich linearer Beziehung an.
Die maximum oder minimum Siedepunkte sind durch Druck hervorgehoben.

INDICE

Sistemi a due componenti. 309
Sistemi a tre componenti. 314
Miscele azeotropiche..... 318

ABBREVIAZIONI

B. P. Punto di ebollizione.
M % Grammi molecole %_. (Salvo i casi in cui è indicato diversamente.)
↓ Relazione lineare entro l'intervallo così indicato.
I massimi e minimi nei punti di ebollizione sono segnati in carattere neretto.

TWO-COMPONENT
SYSTEMS

A-B-TABLE

Standard arrangement (v. p. viii)

Argon

B = N₂ (20)

B. P., °K	M % A	
	Liq.	Vap.

1500 mm

83.55	0	0
84.9	20	9.5
86.4	40	21.5
89.5	70	49.0
92.3	90	77.5
94.18	100	100

1000 mm

79.70	0	0
80.9	20	8.7
82.4	40	20.4
85.2	70	45.5
87.95	90	75.0
89.93	100	100

760 mm

77.30	0	0
78.48	20	8.6
79.8	40	19.0
82.6	70	43.6
85.25	90	73.5
87.25	100	100

500 mm

73.90	0	0
74.97	20	7.8
76.22	40	17.7
78.8	70	41.0
81.42	90	70.4
83.45	100	100

O₂B = N₂ (1)

B. P., °K	M % A	
	Liq.	Vap.

760 mm

77.3	0	0
78.0	8.10	2.2
79.0	21.60	6.8
80.0	33.4	12.0
81.0	43.4	17.7
82.0	52.2	23.6
83.0	59.5	29.9
84.0	66.2	36.9
85.0	72.3	44.3
86.0	77.8	52.2
87.0	82.9	60.3
88.0	88.5	69.6
89.0	93.8	79.8
89.5	96.5	87.0
90.1	100	100

H₂O

Aqueous Mixtures

B = HCl (7)

v. also p. 301

B. P., °C	M % B
-----------	-------

100	0.0
101.8	2.0
103.3	4.0
105.3	6.0
108.0	8.0
109.7	10.5
109.0	12.0
105.2	14.0
92.0	17.0
82.7	18.5
19.0	26.3

B = Br₂, v. (52)

B = HBr (8)

v. also p. 306

B. P., °C	M % B	Vap.
-----------	-------	------

760 mm

100.0	0
114.7	2
122.4	6
126.0	15
124.3	25
104.3	70
92.0	80
36	90
26	95

B = HNO₃ (10)

v. also p. 304

B. P., °C	M % B
-----------	-------

760 mm

100.0	0
106.0	10
114.6	20
120.4	30
121.9	37
120.4	45
114.9	55
103.4	70
95.2	86

360 mm

80.5	0
86.5	10
92.3	20
98.2	30
100.2	39
96.6	50
89.6	60
63.5	99

p, mm Hg	B. P., °C	M % B (37)	
		Liq.	Vap.
190	65.5	8.20*	0.404*
237	72	8.28	0.495
465	93	8.54	0.522
566	100	8.28	0.638
760	106.5	8.36	0.627
870	115.5	8.78	0.462
40	40.2	13.9†	1.54†
116	59.0	12.4	1.48
318	87.5	12.4	1.47
458	97.5	12.8	1.51
570	104.0	12.3	1.57
680	108.5	12.3	1.42
760	112	12.3	1.76
40	45.8	22.90§	7.14||
116	66.5	22.2	6.66
317	95.0	21.7	6.08
458	105.5	22.5	7.14
570	111.0	22.1	5.16
760	118.5	22.1	6.60
870	124.2	22.3	4.87
40	52	30.8¶	22.2**
116	70.2	30.5	17.1
317	98.5	30.8	18.9
353	104	31.0	22.4
463	109.5	30.8	22.5
517	112.5	30.7	22.6
553	113.5	31.0	22.9
622	115.5	31.0	22.3
670	117.5	30.8	22.2
725	120.5	30.8	19.0
763	121.6	30.8	16.6
40	52.6	34.6††	34.6††
116	72.0	35.8	35.6
116	72.1	36.0	36.1
324	102	33.6	22.3
458	109	37.4	36.7
465	110.1	35.3	34.7
574	113.9	38.1	38.0
760.2	121.9	38.3	38.3
870	126.0	34.2	29.1
870	126.3	36.3	34.8
1010	130.6	34.9	34.8
40	52.0	40.3††	62.0††
116	71.5	40.1	64.3
325	98.5	40.3	52.2
398	104	40.0	53.8
458	108	39.5	53.5
570	113.5	40.0	49.3
754	121	40.2	60.2
40	47.6	46.0§§	84.3|||
116	67.0	45.7	74.2
325	93.0	46.0	71.5
408	103.0	45.8	65.2
540	110.0	45.1	83.8
760	118.0	46.5	75.9
40	43	53.2¶¶	92.5¶¶
116	56	56.2	91.8
458	91	56.2	93.1
570	98	54.9	88.8
760	112	53.0	89.1
870	120.5	54.2	86.0
40	38	61.2***	95.3†††
116	52.5	63.0	96.8
345	78	61.2	95.4
458	84	61.5	95.9
570	92	61.5	94.2
760	99	61.5	92.1

*† 0.05 M % NO₂ present.† 0.04 M % NO₂ present.§ 0.14 M % NO₂ present.|| 0.11 M % NO₂ present.¶ 0.16 M % NO₂ present.** 0.14 M % NO₂ present.†† 0.18 M % NO₂ present.††† 0.23 M % NO₂ present.§§ 0.3 M % NO₂ present.||| 0.4 M % NO₂ present.¶¶ 0.2 M % NO₂ present.*** 0.4 M % NO₂ present.††† 0.2-0.7 M % NO₂ present.

p, mm Hg	B. P., °C	M % B	
		Liq.	Vap.
40	32.5	71.5†††	99.5†††
116	47.5	72.7	98.6
315	63	74.6	98.9
458	75	73.7	99.2
570	80.3	73.9	99.2
760	90.5	71.6	98.4
870	100.0	76.3	95.4
40	29	83.7|||	98.9¶¶¶
116	43.5	84.7	99.3
458	69	84.0	99.1
760	85.5	86.2	99.1
870	90.5	85.4	99.4
40	27.5	92.6****	98.8****
116	41.5	92.3	98.6
315	59.0	92.9	99.1

††† 0.4-0.6 M % NO₂ present.§§§ 0.1-0.7 M % NO₂ present.||| 0.3-0.6 M % NO₂ present.¶¶¶ 0.2-0.5 M % NO₂ present.**** 0.4 M % NO₂ present.B = CH₂O₂

Formic acid, v. p. 364

B = CH₄O (12)

Methyl alcohol

B. P., °C	M % B
-----------	-------

800 mm

101.4	0
93.0	6
87.9	12
83.4	20
79.6	30
76.9	40
73.8	55
68.4	85
65.9	100

760 mm

100.0	0
91.6	6
86.5	12
82.0	20
78.2	30
75.6	40
72.4	55
67.1	85
64.6	100

700 mm

97.7	0
89.3	6
84.3	12
79.8	20
76.1	30
73.5	40
70.3	55
65.1	85
62.6	100

B = C₂HBr₃O (13)

Bromal

B. P., °C	M % B
-----------	-------

760.4 mm

100.0	0
100.2	4
100.3	10.8
100.2	24.2
99.8	35.6

B = C₂HBr₃O.—(Continued)

B. P., °C	M % B
759.8 mm	
99.3	42.7
100.1	50.0
758.7 mm	
100.2	89.3
100.4	95.8
100.6	98.4

B = C₂H₄O (35)

Acetaldehyde

B. P., °C	M % B	
	Liq.*	Vap.†
100	0	0
93.5	0.5	25
82	1	50
63	4	75
43	10	89
33	20	93
29	30	
25.3	50	
24.6	60	
23.8	75	

* 760 mm ± 5.

† 761 mm.

B = C₂H₄O₂ (38)

Acetic acid

v. also p. 306

B. P., °C	M % B	
	Liq.	Vap.
760 mm		
100.00	0	0
100.50	10	6.3
101.18	20	12.2
102.05	30	18.5
103.15	40	26.0
104.33	50	34.0
105.78	60	43.0
108.95	75	60.0
111.85	85	73.8
118.10	100	100
763 mm (average) (35)		
100	0	0
101.1	20	15
102.5	40	28.5
105.3	60	45
110.4	85	70
118.0	100	100

B = C₂H₆O

Ethyl alcohol

v. also p. 290

M % B	B. P., °C	
	800 mm	760 mm
	(12)	(12)
0	101.4	100.0
2	96.7	95.1
5	92.0	90.5
7	90.0	88.6
10	87.9	86.5
20	84.6	83.2
30	83.0	81.7
40	82.1	80.8
50	81.3	80.0
60	80.7	79.4
75	80.0	78.7
90	79.5	78.2
100	79.7	78.4

B = C₂H₆O.—(Continued)

M % B	B. P., °C	
	700 mm	640 mm
	(12, 39)	(39)
0	97.7	95.2
2	92.8	90.3
5	88.3	85.8
7	86.4	83.9
10	84.3	81.9
20	81.1	78.9
30	79.6	77.5
40	78.7	76.6
50	77.9	75.9
60	77.3	75.3
75	76.6	74.6
90	76.2	74.3
100	76.3	74.3

B. P., °C **M % B** (14)

	Liq.	Vap.
760 mm		
100.0	0	0
93.9	2	24.0
89.2	5	40.8
87.2	7	47.3
85.3	10	52.4
82.2	20	59.8
81.0	30	63.0
80.3	40	65.2
79.6	50	68.6
78.9	60	72.0
78.3	70	78
78.2	80	80

B. P., °C **M % B** (33)

760 mm	
95.3	2
90.4	5
86.1	10
83.5	20
81.9	30
79.8	50
78.6	70
78.3	80
78.2	85
78.2	90
78.3	100

B = C₃H₆O (19)

Acetone

v. also p. 290

B. P., °C	M % A
56.9	0
59.0	30
61.6	60
62.6	70
64.5	80
69.6	90
77.9	95
100.0	100

B = C₃H₈O (12)*n*-Propyl alcohol

B. P., °C	M % B
800 mm	
92.8	3.2
89.9	10
89.4	20
89.1	40
89.2	50
90.9	75
98.5	100
760 mm	
91.7	3
88.5	10
88.1	20
87.75	40
87.9	55
89.7	75
97.26	100
700 mm	
89.0	3.2
86.3	10
85.9	20
85.6	40
85.8	55
87.5	75
95.0	100

B = C₃H₈O (12)

Isopropyl alcohol

B. P., °C		M % B
800 mm		
101.45		0
90.5		3
85.0		10
83.6		20
83.1		30
82.6		40
81.9		55
81.7		67
81.8		75
83.7		100
760 mm		
100		0
89.8		3
83.6		10
82.0		25
80.5	↓	56
80.4		67
80.5		75
82.4		100
700 mm		
97.7		0
87.5		3
81.5		10
80.2		20
79.1		40
78.5		56
78.3		70
80.3		100
B. P., °C	M % B	
	Liq.	Vap.
760 mm (24)		
100	0	0
95	1	19
90	2	34
86.7	3	43

B = C₃H₈O.—(Continued)

B. P., °C	M % B	
	Liq.	Vap.
760 mm (24).—(Continued)		
83.5	6	50.5
81.5	15	56
81.0	30	58
80.7	50	63
80.5	70	70
81.0	80	77
82.3	90	83

B = C₃H₈O₃ (6)

Glycerol

v. also p. 291

M % B	p, mm Hg	B. P., °C
81.11	189.1	125.11
	268.6	136.72
	363.5	147.48
	538.7	161.99
63.02	120.6	86.00
	187.8	97.49
	244.0	104.45
	367.3	116.07
	451.6	122.39
	549.6	128.55
55.04	114.9	78.35
	330.8	105.80
	461.7	115.50
	580.4	122.50
38.04	115.5	68.22
	185.5	79.24
	262.5	87.84
	389.2	98.32
	525.5	106.81
20.90	194.0	77.85
	312.7	89.57
	415.0	96.95
	541.5	104.33
20.46	145.3	66.64
	246.5	78.88
	370.0	89.05
	515.5	97.72
12.61	190.3	69.34
	393.9	87.09
	499.9	93.34
	612.1	98.85
7.22	127.8	58.77
	223.4	71.23
	331.2	80.71
	468.3	89.53
	631.2	97.61
4.68	180.8	65.32
	293.3	77.08
	525.0	91.42
	640.9	96.84
2.01	190.7	65.87
	341.3	79.58
	502.3	89.41
	672.8	97.37

B = C₃H₈O₃.—(Continued)

B. P., °C	M % B	
760 mm (16, 27, 29)		
100	0	
103.5	10	
107.5	20	
113.0	30	
118.0	40	
125.0	50	
133.5	60	
145.5	70	
162	80	
174	85	
193	90	
223	95	
249	98	
290	100	
M % B	B. P., °C (29)	
	700 mm	650 mm
0	98	96
10	101.5	99
20	105.5	103
30	110.5	108
45	119	117
65	137	134
100	287	284.5
	600 mm	550 mm
0	93.5	91
10	97	94.5
20	101	98.5
30	105.5	103.5
45	114.5	112
65	131.5	129
100	282	279
	500 mm	450 mm
0	89	86
10	92	89
20	96	93
30	100.5	97.5
45	109.5	106.5
65	126	122.5
100	276	272
	400 mm	350 mm
0	83	79.5
10	86	82.5
20	89.5	86
30	94.5	91
45	103	99.5
65	119	115
100	268	264
	300 mm	250 mm
0	76	71.5
10	79	74.5
20	82.5	78
30	87	82.5
45	95	90.5
65	110.5	105
100	259	253.5
	200 mm	150 mm
0	66.5	60
10	69	62.5
20	72.5	66
30	77	70
45	85	78
65	99	91.5
100	247	238.5

B = C₃H₈O₃.—(Continued)

M % B	B. P., °C (29)	
	100 mm	40 mm
0	52	34
10	54	36
20	57	38.5
30	61	42.5
45	69	49.5
65	81.5	60
100	227.5	210*

* At 50 mm.

B = C₄H₁₀O (12)
Trimethylcarbinol

B. P., °C	M % B
800 mm	
101.45	0
85.7	3
82.5	10
82.0	30
81.6	50
81.3	69
83.85	100
760 mm	
100.00	0
85.0	3
81.1	10
80.7	30
80.3	50
80.0	69
82.55	100
700 mm	
97.70	0
82.0	3
79.1	10
78.6	30
78.2	50
77.9	69
80.45	100

B = C₅H₄O₂ (28)
Furfural

B. P., °C	M % B	
	Liq.	Vap.
760 mm		
100.00	0	0
98.56	1	5.5
98.07	2	8.0
97.90	4	9.2
97.90	9.2	9.2
97.90	50	9.2
98.7	70	9.5
100.6	80	11
109.5	90	19
122.5	92	32
146.0	94	64
154.8	96	81
158.8	98	90
161.7	100	100

B = C₆H₈N₂ (4)
Phenylhydrazine

B. P., °C	M % B
104	15
106	30
114	65
168	86
243	100

Non-Aqueous Mixtures**HCl****B = C₆H₇N (26)****Aniline**

B. P., °C	M % A
755 mm	
183	0
186	20
190	30
205	40
244	48
245	49
220	50
206	50.2

SO₃**B = H₂SO₄**

v. p. 304

H₂SO₄**B = NH₃ (22)**

B. P., °C	M % B
490	50
474	52
431	54
410	55
394	56
381	57
371	58
361	59

S₂O₅Cl₂**B = ClSO₂OH (44)****N₂O₄****B = HNO₃ (36)**

B. P., °C	M % A	
	Liq.	Vap.
78.5	0	0
65.0	3.5	58.0
55.0	7.8	77.0
33.0	20.3	99.9
22.0	100	100

NH₄Cl**B = ZnCl₂ (17)**

B. P., °C	M % B
342	40
343	49
345	58
350	70
358	75
385	87
730	100

B = CdCl₂ (17)

B. P., °C	M % B
338	0
340	28
342	40
363	50
399	60
442	70

B = CdCl₂.—(Continued)

B. P., °C	M % B
492	80
550	90
964	100

B = CuCl (17)

B. P., °C	M % B
338	32
340	41
346	54
360	66
382	80
415	91
954	100

B = LiCl (17)

B. P., °C*	M % B
332	35
338	45
344	54
351	64

* Liq. phase, only between 35 and 64 M % B.

SnBr₄**B = SnI₄ (40)**

B. P., °C	M % B
206.8	0
209.6	10
215.0	20
221.7	30
230.0	40
240.7	50
253.5	60
268.2	70
288.2	80
312.1	90
346.0	100

NaCl**B = KCl (18)**

B. P., °C	M % A	
	Liq.	Vap.
3.49 mm		
890	0	0
894	20	
903		20
914	40	
927		40
928	60	
937		60
946	80	
950		80
965	100	100
B. P., °C		
2.44 mm	1.08 mm	Liq.
870	830	0
873	834	20
891	851	40
906	869	60
924	890	80
945	920	100

C-Compounds

C-TABLE, the C-Arrangement

CO		
B = C ₄ H ₁₀ O (47)		
Ethyl ether		
B. P., °C	M % A	
	Liq.	Vap.
	750 mm	
34.2	0	0
+15.0	1.4	55.0
0	2.3	76.2
-24.0	6.8	94.0
-64.0	27.4	99.8
-78.6	47.4	100.0

CCl ₄		
B = CS ₂ (42)		
B. P., °C	M % A	
46.4	0	
48.7	15	
51.5	30	
56.1	50	
60.5	65	
64.0	75	
68.3	85	
70.9	90	
76.7	100	

B = CHCl ₃ (19)		
B. P., °C	M % A	
61.50	0	
63.1	20	
65.0	40	
66.3	50	
67.7	60	
69.3	70	
71.3	80	
73.8	90	
76.75	100	

B = C ₂ H ₄ Br ₂ (45)		
Ethylene bromide		
B. P., °C	M % A	
	749 mm	
130.2	0	
112.5	15	
104.1	25	
98.0	35	
93.1	45	
89.4	55	
86.3	65	
80.6	85	
76.8	100	

B = C ₂ H ₆ O (48)		
Ethyl alcohol		
B. P., °C	M % A	
	Liq.	Vap.
	745 mm	
77.9	0	0
72.8	6.4	25
70.3	11.4	35
68.0	17.6	45
65.0	33.6	55
63.8	60	60
(63.6)	(63)	(63)
64.3	72.8	67
75.9	100	100

B = C ₄ H ₈ O ₂ (48)		
Ethyl acetate		
B. P., °C	M % A	
	Liq.	Vap.
	745 mm	
76.5		0
75.8	9.5	10
75.2	17.9	20
74.7	28.4	30
74.3	37.3	40
74.1	44.0	50
74.1	58.0	60
74.3	68.2	70
74.9	83.9	85
75.9	100	100

B = C ₄ H ₁₀ O (48)		
Ethyl ether		
B. P., °C	M % A	
	Liq.	Vap.
34.75	0	0
44.7	10	2
50.6	20	5
56.8	32	10
60.5	40	15
65.6	53	25
70.2	67	40
72.4	76	50
77.7	100	100

B = C ₆ H ₆ (42)		
B. P., °C	M % B	
76.69	0	
77.03	25	
77.32	40	
77.60	50	
77.97	60	
78.47	70	
79.30	85	
80.23	100	

B = C ₇ H ₈ (45)		
Toluene		
B. P., °C	M % A	
	749 mm	
110.1	0	
105.2	10	
101.2	20	
97.2	30	
93.2	40	
90.0	50	
87.0	60	
84.2	70	
80.3	85	
76.8	100	

CS ₂		
B = C ₃ H ₆ O ₂ (42)		
Methyl acetate		
B. P., °C	M % B	
56.2	0	
51.3	5	
48.3	10	
43.8	20	
41.2	30	

B = C ₃ H ₆ O ₂ —(Continued)		
B. P., °C	M % B	
40.1	40	
39.5	50	
39.1	65	
39.6	80	
41.0	90	
42.5	95	
46.3	100	

B = C ₆ H ₆ (9)		
B. P., °C	M % B	
45.75	0	
47.6	20	
48.7	30	
51.3	50	
52.9	60	
55.3	70	
59.5	80	
65.7	90	
79.55	100	

CHCl ₃		
B = CH ₃ O (48)		
Methyl alcohol		
B. P., °C	M % A	
	Liq.	Vap.
	757 mm	
64.9	0	0
63.7	3.6	10
60.8	10	23.4
59.5	13.7	30
57.7	20	39.8
55.6	30.4	50
54.4	40	54.4
53.7	50	58.4
53.4	(63)	(63)
53.6		68
53.7	71	
61.4	100	100

B = C ₂ H ₆ O (46)		
Ethyl alcohol		
B. P., °C	M % B	
60.95	0	
59.1	7	
59.6	15	
61.4	30	
63.3	40	
65.7	50	
68.4	60	
71.0	70	
73.6	80	
75.8	90	
77.9	100	

B = C ₃ H ₆ O (48)		
Acetone		
B. P., °C	M % A	
	Liq.	Vap.
	750 mm	
56.0	0	0
58.6	16	10
60.5	29	20
61.8	39	30
62.8	47	40
63.5	54	50
63.9	65	70
63.0	82	90
61.2	100	100

B = C ₃ H ₆ O—(Continued)		
B. P., °C	M % A	
	750 mm (42)	
56.20		0
59.40		20
62.76		40
63.88		50
64.59		65
64.25		75
63.24		85
61.32		100

B = C ₆ H ₆ (48)		
B. P., °C	M % A	
	Liq.	Vap.
80.6	0	0
79.8	8	10
79.0	15	20
78.2	22	30
77.3	29	40
76.4	36	50
75.3	44	60
74.0	54	70
71.9	66	80
68.9	79	90
61.4	100	100

B = C ₇ H ₈ (41)		
Toluene		
B. P., °C	M % B	
61.4	0	
66.0	15	
71.5	30	
80.3	50	
85.3	60	
90.8	70	
96.3	80	
102.2	90	
108.9	100	

CH ₃ O		
Methyl alcohol		
B = C ₂ H ₆ O (19)		
Ethyl alcohol		
B. P., °C	M % B	
65.10	0	
66.38	15	
67.32	25	
68.90	40	
70.10	50	
71.48	60	
73.90	75	
75.73	85	
78.75	100	

B = C ₃ H ₆ O (19)		
Acetone		
B. P., °C	M % A	
56.65	0	
55.84	16	
55.90	25	
56.08	35	
56.54	50	
57.48	60	
58.68	70	
60.27	80	
62.48	90	
65.20	100	

C₂H₄Cl₂ Ethylene chloride B = C ₆ H ₆ (42)		
B. P., °C	M % A	
80.24	0	
80.51	10	
80.78	20	
81.08	30	
81.39	40	
82.35	70	
82.74	80	
83.20	90	
83.66	100	

C₂H₄Br₂ Ethylene bromide B = C ₇ H ₈ (45) Toluene		
B. P., °C	M % A	
	749 mm	
110.1	0	
111.5	10	
113.0	20	
114.6	30	
116.3	40	
118.0	50	
120.8	65	
124.5	85	
130.2	100	

C₂H₄O Acetaldehyde B = C ₂ H ₆ O (25) Ethyl alcohol		
B. P., °C	M % B	
	Liq. | Vap.	
	699 mm	
20.1	0	0
25.7	20	
29.5	30	
33.7	40	
41.5	55	4.1
47.4	65	12.3
58.1	80	31.8
65.8	90	50.5
76.2	100	100
	398 mm	
5.8	0	0
11.5	20	
21.2	40	
30.5	55	6.4
36.8	65	16.7
43.5	75	29.0
51.3	85	49.2
62.8	100	100
	77 mm	
-23.9	0	0
-15.2	35	
0	50	
+ 4.6	60	9.2
17.0	70	22.4
22.7	80	33.0
28.0	90	50.0
31.2	95	78.8
34.3	100	100

B = C₂H₄O₂ (35) Acetic acid		
B. P., °C	M % B	
	Liq. | Vap.	
	768 mm	
42.0	3.5	58.2
55.5	10	73.7
69.3	20	82.5
83.7	36	90.8

C₂H₄O₂ Acetic acid B = C ₆ H ₆ (42)		
B. P., °C	M % A	
80.2	0	
84.6	35	
88.8	55	
92.0	65	
94.0	70	
98.8	80	
105.8	90	
109.5	93.5	
79.576 (3)	0.0	
79.451	1.0	
79.420	2.6	
79.448	4.0	
79.480	5.0	
79.596	8.0	
79.667	9.4	

C₂H₅Br B = C ₆ H ₆ (48)		
B. P., °C	M % A	
	Liq. | Vap.	
	760 mm	
80.2	0	0
79.4	1	10
78.5	2	20
77.4	4	30
76.1	6	40
74.7	8	50
72.8	10	60
70.5	14	70
66.8	21	80
59.8	34	90
49.2	61	97
38.4	100	100

C₂H₆O Ethyl alcohol B = C ₂ H ₅ I (21)		
B. P., °C	M % B	
70.9	26	
68.5	35	
66.2	45	
64.4	55	
62.4	70	
61.6	80	
61.3	87	
61.4	90	
62.2	95	
72.3	100	

B = C₃H₆O (46) Acetone		
B. P., °C	M % A	
55.6	0	
56.7	10	
58.0	20	
59.3	30	
60.8	40	
62.5	50	
64.4	60	
66.8	70	
69.8	80	
73.4	90	
77.7	100	

B = C₃H₈O (34) <i>n</i> -Propyl alcohol		
B. P., °C	M % B	
	Vap.	
	761 mm	
78.4	0	
81.0	10	
83.5	20	
86.1	30	
87.8	40	
89.3	50	
93.1	75	
97.2	100	

B = C₄H₁₀O (19) Ethyl ether		
B. P., °C	M % A	
35.0	0	
43.5	40	
46.0	50	
58.5	75	
70.0	90	
79.0	100	

B = C₆H₆ (46)		
B. P., °C	M % A	
72.1	16	
70.2	25	
68.4	35	
67.4	46	
66.9	65	
67.1	75	
67.6	85	
70.5	95	
79.5	100	
B. P., °C	M % B	
	Liq. | Vap.	
	750 mm (48)	
78.1	0	0
74.4	6	20
72.4	11	30
70.1	20	40
68.3	39	50
67.8	57?	56
68.3	72	60
70.8	89	70
75.2	96	85
79.7	100	100

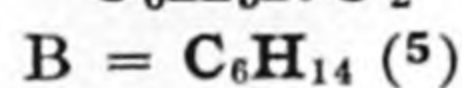
C₃H₆O Acetone B = C ₄ H ₁₀ O (19) Ethyl ether		
B. P., °C	M % A	
35.0	0	
35.9	20	
36.7	30	
37.8	40	
39.2	50	
41.0	60	
43.4	70	
46.5	80	
49.8	90	
56.8	100	

B = C₇H₈ (41) Toluene		
B. P., °C	M % B	
56.5	0	
58.7	10	
60.9	20	
64.7	35	
69.2	50	
74.8	65	
88.2	85	
109.4	100	

C₄H₁₀O Ethyl ether B = C ₆ H ₆ (19)		
B. P., °C	M % B	
34.7	0	
38.3	15	
42.4	30	
45.8	40	
49.4	50	
53.8	60	
62.0	75	
68.9	85	
80.3	100	

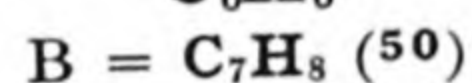
C₅H₁₂ Isopentane B = C ₆ H ₅ NO ₂ (23) Nitrobenzene		
B. P., °C	M % B	
28	0	
29	1	
30	10	
30.5	20	
33	60	
210.8	100	

C₆H₄Br₂ Dibromobenzene Binary mixtures of <i>o</i> -, <i>m</i> -, and <i>p</i> - derivs. Compn. of vap. phase given (32)		
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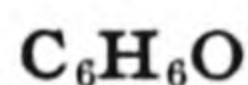
n-Hexane

B. P., °C	M % A
69.0	0
71.7	10
72.9	20
73.8	30
74.6	40
75.4	50
77.7	60
85.0	70
103.4	80
143.4	90
210	100

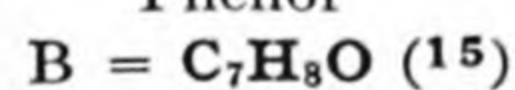


Toluene

B. P., °C	M % B
81.0	3.8
84.5	20
86.9	30
89.5	40
92.4	50
95.5	60
98.8	70
102.3	80
106.3	90
110.0	98.6

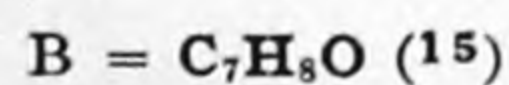


Phenol



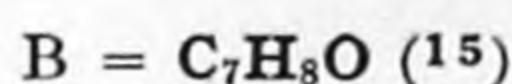
o-Cresol

B. P., °C	M % A
191.0	0
189.9	10
185.9	60
185.1	70
184.1	80
183.1	90
182.2	100



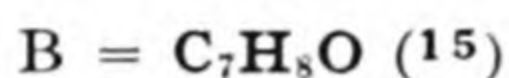
m-Cresol

B. P., °C	M % A
202.3	0
199.9	10
196.8	20
194.3	30
192.1	40
190.3	50
189.1	60
187.6	70
186.0	80
184.2	90
182.4	100



p-Cresol

B. P., °C	M % A
201.7	0
198.8	10
195.9	20
193.6	30
191.5	40
189.6	50
188.0	60
186.5	70
182.3	100



Cresol*

B. P., °C	M % A
197.8	0
192.1	30
188.9	50
187.3	60
185.8	70
183.4	90
182.2	100

* 32.0 Wt. % *o*-, 43.4 % *m*-, 24.6 % *p*-.

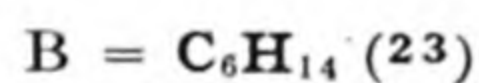


Aniline



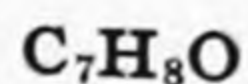
Cyclohexane

B. P., °C	M % A
80.8	0
81.2	2
86.0	35
96.0	70
184.4	100

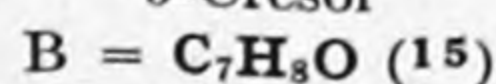


n-Hexane

B. P., °C	M % A
68.9	0
70.8	10
72.2	20
73.0	30
73.4	40
73.4	60
74.1	70
78.9	80
83.4	85
184.4	100



o-Cresol

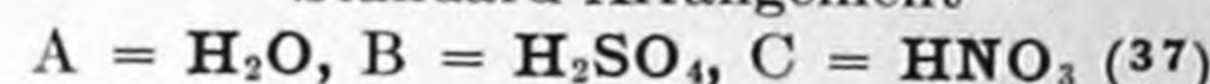


m-Cresol

B. P., °C	M % A
202.3	0
197.3	40
196.2	50
192.3	90
191.2	100

THREE-COMPONENT SYSTEMS

Standard Arrangement



<i>p</i> , mm Hg	B. P., °C	M % in liq.*		M % in vap.*	
		C	B	C	A
300	87	9.08	2.50	1.77	98.3
440	95	9.80	2.57	1.25	98.7
570	102	9.79	2.46	1.19	98.8
760	110	9.79	2.48	1.21	98.8
300	92	16.2	2.77	6.35	93.7
440	103	18.2	2.97	6.70	93.3
550	107.5	17.8	2.89	5.26	94.8
760	117	18.2	2.88	4.98	95.0
760	121	23.0	3.39	13.8	86.2
760	121.2	23.8	3.19	15.2	84.8
300	97.0	21.2	2.79	15.2	84.8
440	104.5	24.5	3.30	20.9	79.1
570	112.5	25.5	3.31	22.6	77.4
760	121.5	25.7	3.36	22.3	77.6
300	96.0	27.2	3.36	27.5	72.5
400	103	26.3	3.38	22.4	77.6
440	104	26.3	3.38	22.4	77.6
760	121	26.1	3.34	26.7	73.3
300	95	31.9	3.60	51.8	48.2
400	102.5	31.1	3.55	47.5	52.5
440	103.5	31.1	3.55	47.6	52.4
550	110	31.9	3.63	46.6	53.4
760	120.5	33.3	3.98	46.2	53.8
300	89	41.7	5.36	85.0	15.0
440	102	35.3	3.36	77.9	22.1
550	97.5	46.5	4.32	77.1	22.9
760	117.5	36.1	3.07	86.2	13.8
300	78.5	51.8	4.78	96.5	3.5
440	89.0	49.9	4.53	93.9	6.09
550	92.5	53.4	4.87	90.8	9.19
760	102	52.8	5.16	88.8	11.2
300	85.0	8.27	5.36	0.94	99.0
440	97.5	8.42	5.53	.94	99.0
550	93.0	8.52	5.71	.96	99.0
760	113.0	8.43	5.76	.90	99.0
300	93.5	14.1	6.36	3.0	97.0
440	103.0	14.9	6.49	3.0	97.0
550	110.0	13.9	5.98	3.0	97.0
760	119.5	13.8	5.90	3.0	97.0
300	96.0	16.8	6.30	10.9	89.1
440	106.0	17.3	6.40	10.8	89.2
550	112.0	17.4	6.68	10.4	89.6
760	122.0	17.1	6.30	10.3	89.7
300	97.0	21.7	6.78	37.8	62.2
440	106.0	20.5	6.99	37.3	62.7
550	112.0	20.9	6.85	35.7	64.3
760	122.0	21.6	6.76	33.9	66.1
300	94.0	30.3	8.03	58.2	41.8
440	104.5	30.6	7.98	56.6	43.4
550	110.0	30.0	7.68	57.9	42.1
760	120.0	30.4	7.82	54.2	45.8
300	71.5	49.0	9.83	90.9	9.13
440	84.5	48.4	9.70	88.8	11.2
550	91.5	48.4	9.70	88.8	11.2
760	120.5	48.8	9.92	87.8	12.2
300	89.0	4.88	9.00	1.2	98.8
440	100.0	4.79	8.98	0.88	99.1
550	107.5	4.70	8.58	.70	99.3
760	116.0	4.90	8.92	.59	99.4

* M % A = 100 - M % (B + C), v. also p. 306.

p, mm Hg	B. P., °C	M % in liq.*		M % in vap.*	
		C	B	C	A
300	94.5	10.25	10.05	0.40	99.6
440	104.5	9.58	9.53	.42	99.6
550	111.5	10.14	9.56	3.8	96.2
760	121.5	9.05	9.80	3.0	97.0
300	98.0	18.1	11.6	37.4	62.6
440	108.0	17.3	11.5	34.7	65.3
550	114.5	17.2	11.4	31.8	68.2
760	124.0	17.7	11.0	32.8	67.2
300	97.6	24.2	12.3	78.4	21.6
440	102.5	24.6	12.4	77.9	22.1
550	110.0	25.0	13.1	76.7	23.3
760	120.0	25.3	13.0	75.5	24.5
300	71.0	47.4	17.2	99.3	0.69
440	82.5	46.0	17.2	98.5	1.5
550	83.0	44.6	16.3	98.3	1.7
760	99.0	43.9	15.4	97.1	2.9
300	98.0	4.8	12.2	8.0	92.0
440	106.0	6.2	13.8	8.3	91.6
550	114.0	4.9	12.8	7.5	92.4
760	124.0	4.9	13.2	7.2	92.8
300	102.0	8.4	14.7	12.9	87.1
440	111.0	8.5	14.7	13.4	86.6
550	117.5	8.7	14.3	13.4	86.6
760	127.0	7.7	13.1	13.6	86.4
300	105.0	11.1	14.6	43.9	56.1
440	112.0	11.0	14.4	43.8	56.2
550	118.0	11.0	15.3	41.2	58.8
760	128.0	10.5	17.3	41.0	59.0
300	100.0	18.5	15.9	76.7	23.3
440	105.5	18.6	16.0	76.3	23.7
550	110.0	18.9	16.1	74.7	25.3
760	119.5	20.5	17.2	73.2	26.8
300	71.5	23.5	18.3	97.4	2.6
440	82.0	24.0	17.8	94.5	5.5
550	102.5	24.0	17.7	87.3	12.7
760	110.0	23.6	18.0	95.0	5.0
300	104.0	6.0	16.4	12.4	87.6
440	114.5	5.4	16.3	12.1	87.9
550	120.5	5.5	16.6	12.1	87.9
760	130.0	5.5	17.6	17.2	82.8
300	106.5	9.0	19.8	31.4	68.6
440	116.0	9.0	19.0	31.4	68.6
550	122.5	8.9	18.4	30.0	70.0
760	133.5	8.9	19.0	30.0	70.0
300	106.0	12.3	21.0	75.9	24.1
440	116.0	12.7	22.0	75.7	24.3
550	122.0	12.8	21.9	74.3	25.7
760	130.0	12.8	22.0	72.0	28.0
300	80.0	23.5	25.7	93.3	6.7
440	89.0	22.3	25.0	93.4	6.6
550	100.0	23.2	25.4	90.5	9.5
760	110.0	23.1	24.5	91.8	8.2
300	66.5	40.6	32.5	99.0	1.0
440	80.0	38.1	30.5	99.3	0.7
550	86.5	37.5	30.0	98.6	1.4
760	97.5	40.3	31.2	97.2	2.8
300	116.0	3.8	24.4	23.0	76.9
440	127.5	3.1	23.3	23.0	77.0
550	135.0	3.0	23.2	21.7	78.3
760	145.0	3.1	23.5	20.9	79.1

p, mm Hg	B. P., °C	M % in liq.*		M % in vap.*	
		C	B	C	A
300	116.5	6.5	25.1	38.3	61.7
440	127.5	6.7	25.1	37.9	62.1
550	135.0	6.7	25.3	37.5	62.5
760	145.0	6.5	25.3	36.7	63.3
440	103.0	16.7	30.6	99.8	0.2
550	110.0	15.6	30.2	96.5	3.5
760	120.0	15.8	30.9	95.9	4.1
300	71.00	33.3	40.8	99.8	0.2
440	82.50	32.8	39.2	99.8	0.2
550	89.00	33.9	39.4	96.6	3.4
760	99.00	31.5	37.4	99.7	0.3
300	105.0	14.6	29.4	94.2	5.8
440	116.0	13.7	29.1	93.3	6.7
550	124.0	14.0	30.1	93.6	6.4
760	134.0	13.6	29.1	91.8	8.2
300	121	7.2	30.2	72.5	27.5
440	132.0	7.7	32.3	71.4	28.6
550	137.5	8.3	31.8	69.8	30.2
760	147.0	7.3	30.2	71.0	29.0
300	95.0	14.1	27.8	98.6	1.4
440	106.0	17.9	36.2	98.6	1.4
550	112.5	17.7	37.4	98.6	1.4
760	118.0	17.6	36.5	97.1	2.9

p, mm Hg	B. P., °C	M % liq.			M % vap.		
		C	B	NO ₂	C	NO ₂	A
300	66.0	65.9	27.6	1.1	86.6	5.1	8.3
440	79.0	63.2	28.4	1.1	85.2	5.7	9.1
550	87.0	62.8	28.3	1.5	85.1	5.1	9.8
760	91	63.2	28.5	1.1	84.3	5.2	10.5
300	54	76.3	15.3	1.7	87.6	5.0	7.3
440	73	73.8	14.6	1.7	87.4	5.1	7.5
760	87.5	76.0	15.7	1.6	85.3	5.2	9.5
300	75	37.5	52.4	1.1	90.5	1.7	7.9
440	86	37.3	52.8	1.1	85.4	2.7	12.0
550	95	39.1	54.0	1.1	83.4	3.9	12.7
760	104	24.5	37.2	0.7	78.7	4.9	16.4
300	67	31.8	23.2	0.7	93.8	1.5	4.8
440	79.5	31.8	22.9	0.7	93.5	1.5	5.0
550	87	31.4	22.9	0.9	93.2	1.6	5.2
760	97	31.8	23.2	0.7	93.2	1.6	5.2
300	73	28.0	24.2	0.7	94.0	1.3	4.7
440	85	27.5	24.0	0.8	93.8	1.3	4.8
550	90	27.9	24.1	0.6	93.5	1.4	5.1
760	100	27.6	24.7	0.7	93.7	1.3	5.0
300	66	39.3	35.2	0.3	94.8	1.3	3.8
440	78	38.0	34.8	0.4	94.2	1.5	4.3
550	88	37.9	34.5	0.4	94.2	1.6	4.2
760	98	44.5	43.7	1.4	93.8	1.6	4.5
300	66	46.7	28.9	0.6	94.5	1.3	4.1
440	78	47.8	28.8	0.4	93.4	1.6	4.9
550	84	48.3	28.9	0.3	93.4	1.4	5.1
760	94	47.0	28.3	0.8	92.0	1.7	6.3
760	88.5	63.6	16.5	0.8	90.2	2.3	7.6
760	84	83.5	5.5	0.2	88.3	2.8	8.8
760	92	53.9	21.4	1.0	91.3	1.9	6.7

* M % A = 100 - M % (B + C), v. also p. 306.

A = H₂O, B = H₂SO₄, C = CH₃CO₂H (35)

B. P., °C	p, mm Hg	Liq.*		Vap.†
		M % C	M % B	M % C
298	761	14.74	80.33	23.08
250	761	28.17	67.54	58.88
200	761	39.63	55.84	61.71
170	761	49.92	44.88	74.82
160	761	60.54	36.20	78.01
140	761	74.38	24.11	80.44
128	761	85.03	12.46	91.54
121	761	90.74	5.05	93.33
105	763	7.15	4.37	7.02
105	760	16.60	4.36	18.57
105	761	26.57	3.24	23.08
110	761	9.82	8.97	11.30
113	761	30.65	9.89	43.23
110	761	43.48	5.60	54.71
115	759	75.07	4.32	72.98
115	762	37.46	9.85	54.86
115	762	25.26	11.60	41.53
120	760	11.33	13.87	23.15
130	760	47.04	18.13	72.98
130	760	17.93	17.89	41.42
136	762	27.22	21.42	63.15
148	762	21.14	27.37	54.86
150	762	16.29	29.91	41.18
150	762	5.48	26.01	11.40
170	762	20.22	42.71	39.01
160	762	9.34	30.98	23.22
200	760	10.84	53.06	24.68
250	761	8.44	83.45	22.23

* M % A = 100 - M % (B + C). † M % A = 100 - M % C.

A = H₂O, B = HNO₃, C = KHSO₄ + H₂SO₄ (11)

B. P. at 200, 360 and 760 mm Hg

A = H₂O, B = CH₃CHO, C = CH₃CO₂H (35)

B. P., °C	p, mm Hg	Liq.*		Vap.*	
		M % B	M % C	M % B	M % C
70	756	7.53	22.51	65.76	5.52
77	756	5.83	23.07	63.22	6.45
85	756	4.02	21.88	52.45	8.04
90	756	2.80	24.35	35.77	10.09
70	756	9.82	39.37	72.71	4.79
77	756	7.53	40.52	69.46	9.89
85	756	5.08	41.80	53.87	13.63
90	756	3.87	43.22	39.88	17.24
26.3	766	58.60	3.83		
27	766	55.76	3.87		
30	766	41.43	5.44		
32	766	35.90	7.39		
30	766	57.10	16.87		
32	766	51.89	20.32		
33	766	47.39	22.86		
35	763	26.45	8.55	96.91	0.79
39.5	763	20.67	9.38	89.78	0.76
45	763	15.06	10.07	90.26	0.59
50	763	12.26	10.62	87.07	0.80
55	763	9.37	11.06	87.04	0.89
60	763	8.00	11.02	83.83	1.73
35	764	40.26	22.63	88.74	5.92
39.5	764	36.45	27.96	85.17	11.18
45	764	27.07	29.98	80.69	12.01
50	764	22.76	33.16	78.73	13.94
55	764	17.65	34.58	70.66	19.75
60	764	16.52	37.27		

* M % A = 100 - M % (B + C).

A = H₂O, B = C₂H₅OH, C = C₆H₆ (2); cf. (51)

The following diagram shows the boiling point relations for this system at 760 mm Hg. The lines shown are isotherms. The heavy line separates the region of homogeneous solutions (above) from that of heterogeneous (below). The small cross on this line denotes the composition of a constant boiling mixture which is, however, neither a maximum nor a minimum. The mixture with a minimum boiling point consists of two liquid layers having the compositions of the ends of the 64.85° tie-line.

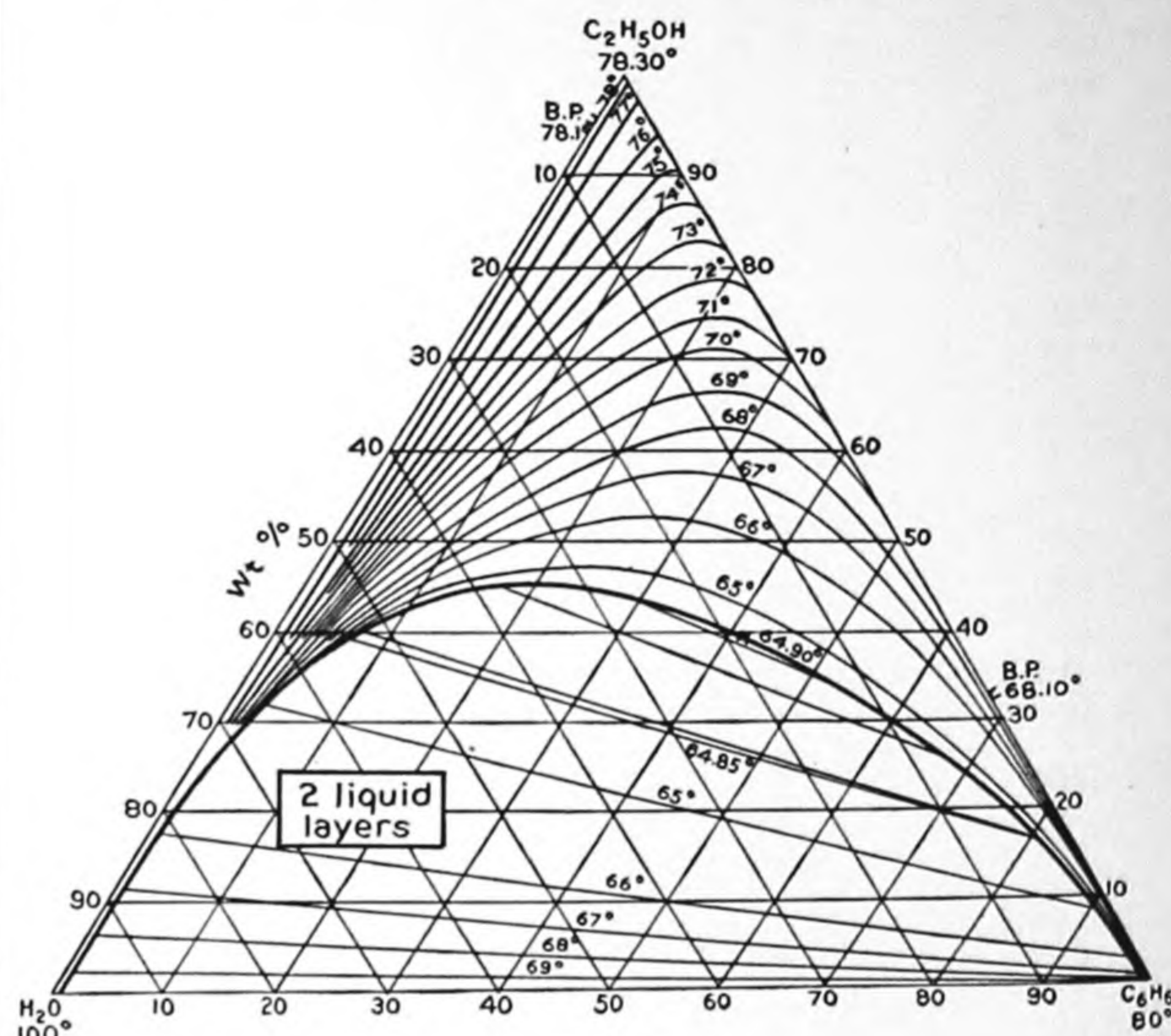


FIG. 1.

A = H₂O, B = C₃H₈O₃ Glycerol, C = NaCl (6)

M % B in (A + B)	g C per 1 soln.	p, mm Hg	B. P., °C
81.10	245	228.5	134.48
		327.4	146.95
		451.9	158.98
55.04	225	143.3	90.43
		159.5	93.22
		302.9	110.79
		397.0	118.87
		594.9	131.58
38.08	205	121.2	74.75
		265.8	94.23
		404.9	105.77
		519.7	113.16
31.24	184	129.9	73.37
		295.4	93.67
		429.2	104.04
		540.6	110.81
22.76	162	135.7	71.27
		150.4	73.63
		215.5	82.28
		268.9	87.80
		389.0	97.60
		480.9	103.51
16.80	143	159.4	73.12
		186.6	76.69
		270.5	85.83
		411.4	96.90
		574.0	106.23

A = H₂O, B = C₃H₈O₃ Glycerol, C = NaCl (6).—(Continued)

M % B in (A + B)	g C per 1 soln.	p, mm Hg	B. P., °C
11.60	122	148.1	69.85
		264.6	83.66
		398.3	94.28
		542.7	102.85
		605.1	105.97
7.89	111	141.8	67.85
		422.9	94.49
		541.2	101.47
4.75	94	150.6	67.82
		264.2	81.15
		463.7	95.72
		565.9	101.40
2.23	81	147.5	66.43
		281.6	82.00
		513.8	97.74
		622.3	103.31

A = H₂O, B = C₆H₆ Benzene, C = C₇H₈ Toluene (25)A = CCl₄, B = C₂H₄Br₂ Ethylene bromide, C = C₇H₈ Toluene (43)

B. P., °C	M % in liq.*		M % in vap.*	
	C	B	C	B
83	25.50	0	11.6	0
83	22.02	3.31	10.1	1.5
83	13.97	10.79	6.2	3.6
83	10.20	14.44	4.3	4.9
83	6.65	17.74	3.0	5.6
83	3.25	20.94	1.3	7.0
83	0	23.88	0	7.7
91	53.32	0	31.3	0
91	52.22	0.91	30.8	0.4
91	35.03	16.05	20.0	6.2
91	20.85	29.24	11.8	11.0
91	14.77	35.11	8.5	12.9
91	9.35	40.30	5.1	14.5
91	0	49.21	0	17.2
99	75.30	0	55.0	0
99	65.56	8.27	48.2	4.0
99	48.05	23.19	34.3	10.4
99	33.80	35.85	23.9	16.2
99	22.55	45.95	16.4	20.0
99	9.53	58.12	6.9	24.6
99	0	67.21	0	28.2
107	93.83	0	86.0	0
107	71.81	17.45	65.4	10.2
107	54.25	31.83	49.1	18.4
107	40.15	43.83	36.0	24.1
107	20.59	60.93	19.0	31.9
107	8.38	71.55	8.1	36.3
107	0	74.20	0	39.6
115	67.46	32.54	77.6	22.4
115	51.25	45.34	58.6	31.1
115	38.78	55.42	43.3	37.4
115	29.59	62.82	34.9	40.4
115	16.28	73.97	19.2	47.2
115	7.92	81.00	9.9	51.0
115	0	88.05	0	55.1

* M % A = 100 - M % (B + C).

A = CCl₄, B = C₂H₄Br₂, C = C₇H₈ Toluene (45)
B. P., °C (749 mm) of A = 76.87; of B = 130.23; of C = 110.11

B. P., °C 749 mm	M %		
	A	C	B
110.8	0	94.8	5.2
107.44	6.3	88.8	4.8
104.07	13.5	82.1	4.5
100.75	21.2	74.7	4.1
97.21	29.6	66.8	3.6
93.92	38.7	58.2	3.2
90.49	48.6	48.7	2.7
87.12	59.4	38.5	2.1
83.21	71.5	27.0	1.5
80.19	85.2	14.8	0.8
111.61	0	89.2	10.8
107.69	7.4	82.6	10.1
104.17	14.4	76.8	9.3
100.72	22.1	69.4	8.5
96.9	31.1	61.3	7.5
93.49	40.4	53.1	6.5
90.03	50.4	44.2	5.4
86.71	61.2	34.7	4.2
83.49	72.7	24.5	3.0
80.08	85.7	12.6	1.6
113.80	0	75.4	24.6
109.37	7.5	69.8	22.8
104.79	15.7	63.5	20.7
100.64	24.3	57.0	18.6
96.52	33.4	50.1	16.4
93.00	42.8	43.1	14.0
89.47	53.0	35.5	11.6
86.14	63.7	27.3	8.9
82.99	74.9	18.9	6.2
79.79	86.6	10.1	3.3
112.63	0	82.6	17.4
108.44	7.3	76.5	16.3
104.50	15.0	70.2	14.8
100.41	23.7	63.0	13.4
96.69	31.9	56.3	11.8
93.18	41.7	48.1	10.1
89.84	51.3	40.3	8.5
86.60	62.2	31.3	6.6
83.21	73.8	21.6	4.5
79.99	85.8	11.8	2.5
115.05	0	67.2	32.8
109.87	8.1	61.7	30.2
104.60	17.0	55.6	27.3
100.63	25.5	50.0	24.6
96.33	34.7	43.8	21.5
92.51	46.6	37.2	18.2
88.68	54.6	30.5	15.0
85.62	65.2	23.4	11.5
82.61	76.2	16.0	7.8
79.70	88.0	8.1	4.0
116.68	0	57.7	42.3
110.71	8.6	52.8	38.8
105.12	17.7	47.4	34.8
100.27	26.9	42.2	31.0
95.91	36.5	36.6	26.9
92.46	46.2	30.9	22.8
88.68	56.2	25.2	18.5
85.37	66.7	19.2	14.1
82.42	77.4	13.0	9.6
79.48	88.7	6.5	4.8

A = CCl₄, B = C₂H₄Br₂, C = C₇H₈ Toluene (45).—(Continued)

B. P., °C 749 mm	M %		
	A	C	B
121.04	0	33.7	66.3
112.51	10.0	30.4	59.5
105.33	20.2	26.9	52.8
99.55	30.7	23.4	45.9
94.79	40.4	20.1	39.5
90.95	50.2	16.8	32.9
87.69	60.1	13.5	26.4
84.51	70.2	10.1	19.7
81.61	80.2	6.6	13.0
79.33	90.0	3.4	6.7
118.54	0	46.6	53.4
111.39	9.5	42.3	48.3
105.32	18.7	37.9	43.4
100.01	28.3	33.5	38.3
95.42	38.3	28.8	32.8
92.00	48.2	24.1	27.6
88.03	58.4	19.4	22.2
84.99	68.5	14.7	16.8
82.12	78.7	9.9	11.3
79.49	88.7	5.2	5.96
124.33	0	18.5	84.2
113.49	11.2	16.4	72.3
105.04	21.9	14.4	63.7
98.98	32.1	12.5	55.3
94.31	42.4	10.7	46.8
90.23	52.6	8.8	38.6
87.05	62.6	6.9	30.5
84.21	72.2	5.2	22.8
81.49	81.7	3.4	14.9
79.17	90.8	1.7	7.5

CONSTANT-BOILING (AZEOTROPIC) MIXTURES

The data in the following tables are based largely on Lecat, *La tension de vapeur des mélanges de liquides. L'azéotropisme*, Brussels, 1918, *q. v.* for literature and for further details.

Only those systems are included for which both the composition and the boiling point are known. In a few cases, the system is composed of two liquid phases. Such cases are marked "2-phase."

The pressure is 760 mm unless otherwise stated. "L. No." = Lecat's number.

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Two-Component Mixtures with Minimum Boiling Point

B-TABLE

B-Constituent (the C-Arrangement)	Min. B. P., °C	Mole % A	L. No.
H₂O			
C ₂ H ₆ O Ethyl alcohol (<i>v. also</i> p. 310, 322).	78.15	10.57	524
C ₃ H ₆ O Allyl alcohol.	88.2	54.5	527
C ₃ H ₆ O ₂ Propionic acid.	99.98	94.7	105
C ₃ H ₈ O <i>n</i> -Propyl alcohol.	87.72	56.83	528
C ₃ H ₈ O Isopropyl alcohol.	80.37	31.46	525
C ₄ H ₈ O Methyl ethyl ketone.	73.45	33	1060
C ₄ H ₈ O ₂ Isobutyric acid.	99.3	94.5	106
C ₄ H ₈ O ₂ Ethyl acetate (<i>v. also</i> p. 322).	70.4	24	1690

B-Constituent (the C-Arrangement)	Min. B. P., °C	Mole % A	L. No.
C ₄ H ₁₀ O Ethyl ether.	34.15	5	1708
C ₄ H ₁₀ O <i>n</i> -Butyl alcohol (2-phase).	92.25	71	532
C ₄ H ₁₀ O Isobutyl alcohol.	89.92	67.14	531
C ₄ H ₁₀ O <i>sec.</i> -Butyl alcohol.	88.5	66	529
C ₄ H ₁₀ O <i>tert.</i> -Butyl alcohol.	79.91	35.41	526
C ₅ H ₁₂ O Isoamyl alcohol (2-phase).	95.15	82.79	533
C ₅ H ₁₂ O <i>tert.</i> -Amyl alcohol.	87	65	530
C ₆ H ₆ Benzene (2-phase).	69.25	29.6	1700
C ₇ H ₈ Toluene (2-phase).	84.1	44.4	1704

SnCl₄

C ₇ H ₈ Toluene.	109.15	28	1981
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C-TABLE

The C-Arrangement by A-Constituent (*v. p. viii*)

B-Constituent (the C-Arrangement)	B. P., °C	Mole % A	L. No.
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CCl₃NO₂ Chloropicrin

C ₃ H ₆ O Allyl alcohol.	92	40	475
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CCl₄ Carbon tetrachloride

CH ₄ O Methyl alcohol.	55.70	44.5	319
C ₂ H ₆ O Ethyl alcohol.	64.95	61.3	353
C ₃ H ₆ O Allyl alcohol.	72.32	73	394
C ₃ H ₈ O <i>n</i> -Propyl alcohol.	72.8	75	408
C ₃ H ₈ O Isopropyl alcohol.	67	64	379
C ₄ H ₈ O Methyl ethyl ketone.	73.8	53.4	1012
C ₄ H ₈ O ₂ Ethyl acetate.	74.75	43	1301
C ₄ H ₈ O ₂ Methyl propionate.	75.5	46	1302
C ₄ H ₁₀ O Isobutyl alcohol.	75.8	89	432
C ₄ H ₁₀ O <i>tert.</i> -Butyl alcohol.	69.5	71	388

CS₂ Carbon disulfide

CH ₄ O Methyl alcohol.	37.65	72	514
C ₂ H ₄ Br ₂ Ethylene bromide.	37.85	41.3	1239
C ₂ H ₄ O ₂ Methyl formate.	24.75	27	1637
C ₂ H ₆ O Ethyl alcohol.	42.4	86	515
C ₃ H ₆ O Acetone.	39.25	61	1047
C ₃ H ₆ O ₂ Ethyl formate.	39.35	62.5	1638
C ₃ H ₆ O ₂ Methyl acetate.	40.15	69.5	1639
C ₃ H ₈ O Isopropyl alcohol.	44.6	90	516
C ₃ H ₈ O ₂ Methylal.	37.25	46	1682
C ₄ H ₈ O Methyl ethyl ketone.	45.85	84.1	1048
C ₄ H ₁₀ O <i>tert.</i> -Butyl alcohol.	45.3	94	517
C ₄ H ₁₀ O Ethyl ether.	34.5	1	1680

CHBrCl₂ Dichlorobromomethane

C ₂ H ₆ O Ethyl alcohol.	75.5	42	356
C ₃ H ₆ O Allyl alcohol.	85.85	62	397
C ₃ H ₈ O <i>n</i> -Propyl alcohol.	86.4	60	411
C ₃ H ₈ O Isopropyl alcohol.	78	49	381
C ₄ H ₁₀ O Isobutyl alcohol.	89.3	78	435

CHBr₃ Bromoform

C ₄ H ₈ O ₂ Butyric acid.	146	82	71
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CHCl₃ Chloroform

CH ₄ O Methyl alcohol.	53.5	65	312
C ₂ H ₆ O Ethyl alcohol.	59.3	84	346
C ₃ H ₈ O Isopropyl alcohol.	60.8	92	374

CH₂O₂ Formic acid

C ₃ H ₇ Br Propyl bromide.	64	40	21
C ₄ H ₉ Cl Isobutyl chloride (B. P., 68°).	62.95	32	20

B-Constituent (the \mathcal{C} -Arrangement)	B. P., °C	Mole % A	L. No.
CH₃I Methyl iodide			
CH ₄ O Methyl alcohol.....	39	74.4	305
C ₂ H ₄ O ₂ Methyl formate.....	31	8	1275
C ₂ H ₆ O Ethyl alcohol.....	41.5	89	337
C ₃ H ₈ O Isopropyl alcohol.....	42.3	93	372
C ₃ H ₈ O ₂ Methylal.....	39.35	42	1501
CH₃NO₂ Nitromethane			
C ₃ H ₆ O Allyl alcohol.....	89	39	500
C ₃ H ₈ O <i>n</i> -Propyl alcohol.....	89.15	44	501
C ₄ H ₁₀ O Isobutyl alcohol.....	94.7	70	503
C ₅ H ₁₀ O Diethyl ketone.....	99.1	64	1038
C ₅ H ₁₀ O Methyl propyl ketone.....	99.15	65	1039
CH₄O Methyl alcohol			
C ₂ HCl ₃ Trichloroethylene.....	60.2	70	321
C ₂ H ₃ N Acetonitrile.....	63.45	84.5	764
C ₂ H ₄ Cl ₂ Ethylene chloride.....	59.5	62	320
C ₂ H ₄ Cl ₂ 1, 1-Dichloroethane.....	49.05	28.5	309
C ₂ H ₅ Br Ethyl bromide.....	34.95	14	303
C ₂ H ₅ ClO Chloromethyl methyl ether.....	56	57.5	482
C ₂ H ₅ I Ethyl iodide.....	54.7	52.5	317
C ₃ H ₆ O Acetone.....	55.7	20	269
C ₃ H ₆ O ₂ Ethyl formate.....	50.95	30.5	541
C ₃ H ₆ O ₂ Methyl acetate.....	54.0	35	542
C ₃ H ₇ Br <i>n</i> -Propyl bromide.....	54.1	49	316
C ₃ H ₇ I <i>n</i> -Propyl iodide.....	63.5	88	325
C ₃ H ₈ O ₂ Methylal.....	41.82	34.5	778
(CH ₃) ₃ BO ₃ Trimethyl borate.....	59	87	543
C ₄ H ₈ O ₂ Ethyl acetate.....	62.3	91.7	544
C ₄ H ₈ O ₂ <i>n</i> -Propyl formate.....	63.7	97	546
C ₄ H ₉ Cl Isobutyl chloride.....	53.05	46.4	314
C ₅ H ₁₀ 2-Methyl-2-butene.....	31.75	13.5	638
C ₆ H ₁₂ <i>n</i> -Pentane.....	31	13	635
C ₆ H ₁₂ Isopentane.....	24.5	9	632
C ₆ H ₆ Benzene.....	58.34	61.4	658
C ₆ H ₈ 1, 3-Cyclohexadiene.....	56.38	61.4	680
C ₆ H ₁₀ Cyclohexene.....	55.9	63.0	689
C ₆ H ₁₀ 1, 5-Hexadiene.....	47.05	43.5	644
C ₆ H ₁₂ Cyclohexane.....	54.2	61	670
C ₆ H ₁₄ <i>n</i> -Hexane.....	50.6	51	647
C ₇ H ₁₄ Methylcyclohexane.....	60	88	703
C ₇ H ₁₆ <i>n</i> -Heptane.....	60.5	83	698
C ₁₀ H ₁₆ α -Pinene.....	64.5	98.5	731
C₂Cl₄ Tetrachloroethylene			
C ₂ H ₆ O Ethyl alcohol.....	77.95	6	367
C ₃ H ₆ ClO α -Epichlorohydrin.....	110.12	36.5	1210
C ₃ H ₆ O Allyl alcohol.....	94.0	27	399
C ₃ H ₆ O ₂ Propionic acid.....	118.95	81	49
C ₃ H ₈ O <i>n</i> -Propyl alcohol.....	94	24	417
C ₃ H ₈ O Isopropyl alcohol.....	81.7	8	384
C ₄ H ₁₀ O <i>n</i> -Butyl alcohol.....	110	47	449
C ₄ H ₁₀ O Isobutyl alcohol.....	103.05	40	443
C ₅ H ₁₀ O ₃ Diethyl carbonate.....	118.55	67	1330
C ₆ H ₁₂ O Isoamyl alcohol.....	116.0	69	457
C ₆ H ₁₂ O ₂ Isobutyl acetate.....	116.6	35.5	1327
C ₆ H ₁₂ O ₃ Paraldehyde.....	118.75	63	863
C₂Cl₆ Hexachloroethane			
C ₂ H ₂ Cl ₂ O ₂ Dichloroacetic acid.....	181	80	214
C₂HCl₃ Trichloroethylene			
C ₃ H ₆ O Allyl alcohol.....	80.95	70	396
C ₃ H ₈ O <i>n</i> -Propyl alcohol.....	81.75	69	410
C ₃ H ₈ O Isopropyl alcohol.....	74	54	380

B-Constituent (the \mathcal{C} -Arrangement)	B. P., °C	Mole % A	L. No.
C₂HCl₃ Trichloroethylene.—(Continued)			
C ₄ H ₁₀ O Isobutyl alcohol.....	85.4	86	434
C ₄ H ₁₀ O <i>tert</i> -Butyl alcohol.....	75	74	389
C ₅ H ₁₂ O <i>tert</i> -Amyl alcohol.....	84	83	426
C₂HCl₅ Pentachloroethane			
C ₄ H ₆ O ₄ Dimethyl oxalate.....	157.55	55.4	1361
C ₅ H ₁₀ O ₂ Isovaleric acid (B. P., 176.5°).....	160.0	82	82
C ₆ H ₆ O Phenol.....	160.85	81.5	1526
C ₆ H ₁₂ O Cyclohexanol.....	157.9	47	462
C ₈ H ₁₆ O ₂ Isoamyl propionate.....	158.7	41.7	1360
C₂H₂Cl₂ <i>cis</i>-1, 2-Acetylene dichloride			
C ₂ H ₆ O Ethyl alcohol.....	57.7	81.4	345
C₂H₂Cl₂ <i>trans</i>-1, 2-Acetylene dichloride			
C ₂ H ₆ O Ethyl alcohol.....	46.5	88.2	339
C₂H₂Cl₂ Dichloroethylene			
C ₃ H ₆ O Allyl alcohol.....	79.6	76	395
C ₃ H ₈ O <i>n</i> -Propyl alcohol.....	80	77	409
C₂H₂Cl₄ Tetrachloroethane			
C ₂ H ₄ O ₂ Acetic acid.....	107.35	36.5	42
C ₄ H ₈ O ₃ Methyl lactate.....	143.3	36	1343
C₂H₃BrO <i>cis</i>-Acetyl bromide			
C ₂ H ₆ O Ethyl alcohol.....	77.7	10.5	363
C₂H₃BrO <i>trans</i>-Acetyl bromide			
C ₂ H ₆ O Ethyl alcohol.....	75.7	30.5	361
C₂H₃ClO₂ Chloroacetic acid			
C ₇ H ₇ Br <i>o</i> -Bromotoluene.....	172.95	46	206
C ₇ H ₇ Br <i>p</i> -Bromotoluene.....	174	62	208
C ₇ H ₇ Cl Benzyl chloride.....	172	34	205
C ₁₀ H ₁₄ O Carvol.....	167.8	43	219
C₂H₃Cl₃ 1, 1, 2-Trichloroethane			
C ₂ H ₆ O Ethyl alcohol.....	77.3	16	364
C₂H₃Cl₃O₂ Chloral hydrate			
C ₆ H ₁₂ Cyclohexane.....	76	13	834
C₂H₃N Acetonitrile			
C ₂ H ₆ O Ethyl alcohol.....	72.5	47	765
C ₃ H ₈ O <i>n</i> -Propyl alcohol.....	81.2	79	767
C ₃ H ₈ O Isopropyl alcohol.....	75	55	766
C₂H₄BrCl 1-Bromo-2-chloroethane			
C ₃ H ₅ ClO α -Epichlorohydrin.....	103.5	76	1207
C₂H₄Br₂ 1, 1-Dibromoethane			
C ₂ H ₆ O Ethyl alcohol.....	77	18	362
C₂H₄Br₂ Ethylene bromide			
C ₂ H ₄ O ₂ Acetic acid.....	114.35	20.7	43
C ₃ H ₆ O ₂ Propionic acid.....	127.75	65	50
C ₄ H ₁₀ O Isobutyl alcohol.....	106.2	22	444
C ₅ H ₁₂ O Isoamyl alcohol.....	123.2	52	458
C ₈ H ₁₀ Ethylbenzene.....	131.1	83.5	1457
C₂H₄Cl₂ 1, 1-Dichloroethane			
C ₂ H ₆ O Ethyl alcohol.....	54.5	84	342
C₂H₄O₂ Acetic acid			
C ₆ H ₅ Cl Chlorobenzene.....	114.65	72.5	44
C ₆ H ₆ Benzene.....	80.05	97.5	127
C ₇ H ₈ Toluene.....	105.4	62.7	132
C ₈ H ₁₀ <i>m</i> -Xylene.....	115.38	40	136

B-Constituent (the ζ -Arrangement)	B. P., °C	Mole % A	L. No.
C₆H₃Cl₃ 1, 3, 5-Trichlorobenzene			
C ₈ H ₁₁ N Ethylaniline.....	203	56	944
C₆H₅Br Bromobenzene			
C ₆ H ₁₂ O Cyclohexanol.....	153.6	55	459a
C ₆ H ₁₄ O ₂ Pinacone.....	152	82	466
C ₈ H ₁₆ O ₂ <i>n</i> -Propyl isovalerate.....	154	50	1350
C ₁₀ H ₁₆ α -Pinene.....	153.4	46.3	1475
C₆H₅ClO <i>p</i>-Chlorophenol			
C ₁₀ H ₈ Naphthalene.....	215.9	36.5	1606
C₆H₅I Iodobenzene			
C ₆ H ₆ O Phenol.....	177.7	34.2	1532
C₆H₅NO₂ Nitrobenzene			
C ₇ H ₈ O Benzyl alcohol.....	204.3	39	508
C ₁₀ H ₁₈ O Borneol.....	207.75	60	509
C ₁₀ H ₂₀ O Menthol.....	207.9	60	510
C₆H₆O Phenol			
C ₇ H ₇ Br <i>p</i> -Bromotoluene.....	176.2	58	1531
C ₁₀ H ₁₆ Carvene.....	169.0	49.5	1965
C ₁₀ H ₁₆ α -Pinene.....	152.75	25	1957
C₆H₇N Aniline			
C ₁₀ H ₁₆ Carvene.....	171.35	48	974
C₆H₁₀O₃ Ethyl acetoacetate			
C ₈ H ₈ Styrene.....	145.2	3	1153
C ₁₀ H ₁₆ Carvene.....	169.05	44	1160
C ₁₀ H ₁₆ α -Pinene.....	153.35	23	1154
C ₁₀ H ₁₆ δ -1, 5-Terpinene.....	171	50	1161
C₆H₁₀O₄ Diethyl oxalate			
C ₇ H ₇ Br <i>o</i> -Bromotoluene.....	177.35	43.8	1373
C ₇ H ₇ Br <i>p</i> -Bromotoluene.....	180.4	56.6	1375
C₆H₁₂O Cyclohexanol			
C ₈ H ₁₀ <i>m</i> -Xylene.....	138.9	5.5	728
C ₈ H ₁₆ O ₂ Isoamyl propionate.....	157.7	77	604
C ₈ H ₁₆ O ₂ Isobutyl butyrate.....	155	26.5	603
C ₉ H ₁₂ Pseudocumene.....	158	64.5	745
C ₉ H ₁₂ Mesitylene.....	156.3	54.5	742
C ₁₀ H ₁₄ Cymene.....	159	76	748
C ₁₀ H ₁₆ Camphene.....	153	42	740
C ₁₀ H ₁₆ Carvene.....	159.25	78.5	751
C ₁₀ H ₁₆ α -Pinene.....	149.9	43	736
C ₁₀ H ₁₈ Menthene.....	157.5	69	746
C₆H₁₂O₂ Isoamyl formate			
C ₆ H ₁₂ O ₃ Paraldehyde.....	122.5	57	882
C₆H₁₂O₃ <i>n</i>-Propyl lactate			
C ₆ H ₁₄ O ₂ Pinacone.....	168	35	607
C ₁₀ H ₁₆ Carvene.....	166.35	64	1826
C₆H₁₄O₂ Pinacone			
C ₈ H ₁₀ O Phenetole.....	169	48	798
C₇H₆Cl₂ Benzal chloride			
C ₈ H ₁₆ O ₃ Isoamyl lactate.....	201.3	45	1387
C₇H₆O Benzaldehyde			
C ₇ H ₇ Cl Benzyl chloride.....	177.9	54	866
C ₁₀ H ₁₄ <i>m</i> -Cymene.....	171	33	897
C ₁₀ H ₁₆ Carvene.....	171.2	49	898
C₇H₇Br <i>o</i>-Bromotoluene			
C ₇ H ₈ O <i>o</i> -Cresol.....	180.3	77	1539
C ₇ H ₁₄ O ₃ Isobutyl lactate.....	180	52	1372

B-Constituent (the ζ -Arrangement)	B. P., °C	Mole % A	L. No.
C₇H₇Br <i>p</i>-Bromotoluene			
C ₇ H ₈ O <i>o</i> -Cresol.....	181.7	68	1541
C₇H₇Cl Benzyl chloride			
C ₉ H ₁₈ O ₂ Isoamyl butyrate.....	177.1	55	1365
C₇H₇NO₂ Nitrotoluene			
C ₁₀ H ₁₈ O Geraniol.....	227.5	67	512
C₇H₈O Benzyl alcohol			
C ₇ H ₈ O ₂ Guaiacol.....	204.4	38	807
C ₈ H ₁₈ O ₂ Isoamylmethylal.....	198.7	63	803
C ₁₀ H ₈ Naphthalene.....	204.3	64	760
C ₁₀ H ₁₆ Carvene.....	176.25	13	755
C ₁₂ H ₁₈ 1, 3, 5-Triethylbenzene.....	200.2	67	757
C₇H₈O <i>o</i>-Cresol			
C ₁₀ H ₁₆ Carvene.....	175.35	30	1972
C₇H₈O Anisole			
C ₈ H ₁₆ O ₂ Isobutyl butyrate.....	151	73	1852
C ₁₀ H ₁₆ α -Pinene.....	150.45	62	1945
C₇H₉N Methylaniline			
C ₁₀ H ₁₆ Carvene.....	174.5	16	978
C₇H₁₄O₂ Isoamyl acetate			
C ₈ H ₁₀ <i>m</i> -Xylene.....	136	45	1802
C₇H₁₄O₂ Isobutyl propionate			
C ₈ H ₁₀ Ethylbenzene.....	133	43	1800
C₇H₁₄O₃ Isobutyl lactate			
C ₁₀ H ₁₆ Carvene.....	172.5	38	1832
C₈H₁₁N Dimethylaniline			
C ₁₀ H ₁₆ Carvene.....	174	29	977
C₈H₁₈O <i>sec</i>-Octyl alcohol			
C ₁₀ H ₁₆ Carvene.....	174.4	42	752
C₉H₁₀O₂ Ethyl benzoate			
C ₁₀ H ₁₈ O Borneol.....	211	69	622
C₉H₁₈O₂ Isoamyl butyrate			
C ₁₀ H ₁₆ Carvene.....	174	43	1828
C₁₀H₁₂O₂ Propyl benzoate			
C ₁₀ H ₁₈ O Geraniol.....	228	43	624
C₁₀H₁₈O Borneol			
C ₁₂ H ₁₈ 1, 3, 5-Triethylbenzene.....	211	59	758

Effect of Pressure upon Azeotropic Mixtures

A = H₂O, B = C₂H₅OH (30, 31, 49)

<i>p</i> , mm Hg	B. P., °C	M % B	<i>p</i> , mm Hg	B. P., °C	M % B
100	34.2	99.6	760	78.1	90.0
150	42.0	96.2	1100	87.8	89.3
200	47.8	93.8	1450	95.3	89.0
400	62.8	91.4			

A = H₂O, B = C₄H₈O₂ Ethyl acetate (30, 31, 49)

<i>p</i> , mm Hg	B. P., °C	M % A	<i>p</i> , mm Hg	B. P., °C	M % A
25	-1.9	14.7	600	64.0	28.9
50	+10.0	16.2	760	70.4	30.5
100	23.0	18.8	900	75.1	31.6
150	31.4	20.7	1050	79.6	32.6
200	37.6	22.2	1200	83.5	33.3
300	46.8	24.5	1350	87.1	34.1
400	53.7	26.1	1500	90.3	34.8
500	59.4	27.6			

A = C₂H₅OH, B = C₄H₈O₂ Ethyl acetate (30, 31, 49)

p, mm Hg	B. P., °C	M % A	p, mm Hg	B. P., °C	M % A
25	-1.4	22.1	600	65.4	43.6
50	+10.6	24.6	760	71.8	46.4
100	23.8	28.2	900	76.5	48.5
150	32.3	31.1	1050	81.1	50.4
200	38.4	33.4	1200	85.0	52.2
300	47.8	37.0	1350	88.7	53.9
400	54.9	39.6	1500	91.8	55.4
500	60.8	41.8			

Two-Component Mixtures with Maximum Boiling Point

B-TABLE

B-Constituent (standard arrangement)	Max. B. P., °C	Mole % A	L. No.
H₂O			
HF.....	120	65.4	2034
HCl.....	110	88.9	2035
HClO ₄	203	32	2041
HBr.....	126	83.1	2036
HI.....	127	84.3	2037
HNO ₃ (735 mm).....	120.5	62.2	2039
CH ₂ O ₂ Formic acid.....	107.1	43.3	2040
HCl			
C ₂ H ₆ O Dimethyl ether.....	-1.5	65	2042

C-TABLE

 CHCl₃

C ₃ H ₆ O Acetone.....	64.5	65.5	2107
CH₂O₂ Formic acid			
C ₆ H ₁₀ O Diethyl ketone.....	105.4	48	2021
C ₈ H ₁₆ O Methyl propyl ketone.....	105.3	47	2022
C₆H₆O Phenol			
C ₆ H ₁₂ O Cyclohexanol.....	182.45	90	2061
C ₇ H ₆ O Benzaldehyde.....	185.6	54	2089
C ₇ H ₈ O Benzyl alcohol.....	206	8	2066
C ₈ H ₁₈ O sec.-Octyl alcohol.....	184.65	58	2063
C ₉ H ₁₈ O ₃ Diisobutyl carbonate.....	192.5	39.3	2162
C₆H₁₀O₄ Diethyl oxalate			
C ₇ H ₈ O o-Cresol.....	193.9	27	2169
C₇H₈O o-Cresol			
C ₈ H ₈ O Acetophenone.....	203.7	24	2126
C ₈ H ₈ O ₂ Phenyl acetate.....	198.6	42.5	2171
C ₈ H ₁₆ O Methyl hexyl ketone.....	191.5	97	2125
C ₉ H ₁₈ O ₂ Isoamyl butyrate.....	192.0	80	2167
C₇H₈O m-Cresol			
C ₈ H ₈ O Acetophenone.....	209	54	2133
C ₈ H ₁₆ O ₃ Isoamyl lactate.....	207.6	60	2190
C₇H₈O p-Cresol			
C ₇ H ₈ O Benzyl alcohol.....	207.0	38	2079
C ₇ H ₉ N o-Toluidine.....	204.5	53	2105
C ₇ H ₉ N p-Toluidine.....	204.35	57	2104
C ₈ H ₈ O Acetophenone.....	208.45	52	2129
C ₁₀ H ₁₆ O Camphor.....	213.15	38	2131

Three-Component Mixtures

B-TABLE

 A = H₂O

Constituents (the C-Arrangement)	Mole %	B. P., °C	L. No.
CCl ₄	57.6	61.8	2249
C ₂ H ₆ OH.....	23.0	2-phase	
CCl ₄	53.8	65.15	2259
C ₃ H ₆ O Allyl alcohol.....	18.7	2-phase	
CCl ₄	54.4	65.4	2264
C ₃ H ₈ O n-Propyl alcohol.....	18.0	2-phase	
C ₂ Cl ₂ cis-Dichloroacetylene.....	37.8	53.8	2243
C ₂ H ₅ OH.....	56.2		
C ₂ Cl ₂ trans-Dichloroacetylene.....	86.2	44.4	2240
C ₂ H ₅ OH.....	8.4		
C ₂ HCl ₃ Trichloroethylene.....	38.4	67.25	2251
C ₂ H ₅ OH.....	41.2	2-phase	
C ₂ HCl ₃ Trichloroethylene.....	49.2	71.4	2260
C ₃ H ₆ O Allyl alcohol.....	17.3	2-phase	
C ₂ HCl ₃ Trichloroethylene.....	51.1	71.55	2266
C ₃ H ₈ O n-Propyl alcohol.....	16.6	2-phase	
C ₂ H ₄ Cl ₂ Ethylene chloride.....	54.9	66.7	2250
C ₂ H ₅ OH.....	25.7	2-phase	
C ₂ H ₅ I.....	53.9	61	2248
C ₂ H ₅ OH.....	19.1	2-phase	
C ₂ H ₅ OH.....	21.5	60	2247
C ₃ H ₇ Br n-Propyl bromide.....	55.6	2-phase	
C ₂ H ₅ OH.....	12.4	70.3	2304
C ₄ H ₈ O ₂ Ethyl acetate.....	60.1		
C ₂ H ₅ OH.....	37.1	69.5	2253
C ₄ H ₉ Br Isobutyl bromide.....	32.5	2-phase	
C ₂ H ₅ OH.....	19.8	58.62	2246
C ₄ H ₉ Cl Isobutyl chloride.....	62.6	2-phase	
C ₂ H ₅ OH.....	22.8	64.86	2314
C ₆ H ₆ Benzene.....	53.9		
C ₂ H ₅ OH.....	25.0	63.6	2316
C ₆ H ₈ 1, 3-Cyclohexadiene.....	52.6		
C ₂ H ₅ OH.....	25.3	64.05	2317
C ₆ H ₁₀ Cyclohexene.....	51.9	2-phase	
C ₂ H ₅ OH.....	22.2	62.1	2315
C ₆ H ₁₂ Cyclohexane.....	54.3		
C ₃ H ₅ I 3-Iodopropylene.....	35.5	78.15	2268
C ₃ H ₈ O n-Propyl alcohol.....	27.6	2-phase	
C ₃ H ₆ O Allyl alcohol.....	9.5	68.3	2333
C ₆ H ₆ Benzene.....	62.2		
C ₃ H ₆ O Allyl alcohol.....	9.3	68.21	2334
C ₆ H ₆ Benzene.....	62.5		
C ₃ H ₆ O Allyl alcohol.....	11.5	67.95	2337
C ₆ H ₁₀ Cyclohexene.....	59.7		
C ₃ H ₆ O Allyl alcohol.....	11.8	66.18	2335
C ₆ H ₁₂ Cyclohexane.....	60.3		
C ₃ H ₆ O Allyl alcohol.....	6.1	59.7	2332
C ₆ H ₁₄ n-Hexane.....	74.1		
C ₃ H ₈ O n-Propyl alcohol.....	15.4	81.2	2222
C ₅ H ₁₀ O Diethyl ketone.....	32.6	2-phase	
C ₃ H ₈ O n-Propyl alcohol.....	8.9	68.48	2340
C ₆ H ₆ Benzene.....	62.8		
C ₃ H ₈ O n-Propyl alcohol.....	11.9	67.75	2342
C ₆ H ₈ 1, 3-Cyclohexadiene.....	58.4		
C ₃ H ₈ O n-Propyl alcohol.....	11.5	68.2	2343
C ₆ H ₁₀ Cyclohexene.....	58.3		
C ₃ H ₈ O n-Propyl alcohol.....	10.3	66.55	2341
C ₆ H ₁₂ Cyclohexane.....	60.3		
C ₃ H ₈ O Isopropyl alcohol.....	18.6	66.51	2322
C ₆ H ₆ Benzene.....	56.5		
C ₃ H ₈ O Isopropyl alcohol.....	21.8	66.1	2325
C ₆ H ₁₀ Cyclohexene.....	52.7		

Constituents (the C-Arrangement)	Mole %	B. P., °C	L. No.
C ₃ H ₈ O Isopropyl alcohol.....	19.2	64.3	2323
C ₆ H ₁₂ Cyclohexane.....	54.8		
C ₄ H ₁₀ O <i>tert.</i> -Butyl alcohol.....	17.5	67.30	2328
C ₆ H ₆ Benzene.....	55.0		
C ₄ H ₁₀ O <i>tert.</i> -Butyl alcohol.....	18.0	65	2329
C ₆ H ₁₂ Cyclohexane.....	53.7		

C-TABLE

The C-Arrangement

Constituents	Mole%	B. P., °C	L. No.
A = CS ₂			
CH ₃ OH.....	24.1	33.92	2236
C ₂ H ₅ Br Ethyl bromide.....	35.4		
A = C ₂ H ₄ O ₂ Methyl formate			
C ₂ H ₅ Br Ethyl bromide.....	23.8	16.95	2417
C ₅ H ₁₂ Isopentane.....	31.0		
C ₄ H ₁₀ O Ethyl ether.....	7.2	20.4	2443
C ₅ H ₁₂ <i>n</i> -Pentane.....	48.2		
A = C ₆ H ₁₂ O ₃ <i>n</i> -Propyl lactate			
C ₈ H ₁₀ O Phenetole.....	35.2	163.0	2445
C ₁₀ H ₁₈ Menthene.....	34.1		

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(For a key to the periodicals see end of volume)

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BOILING-POINT ELEVATIONS, NON-VOLATILE SOLUTES

BLAIR SAXTON

WITH JAMES B. AUSTIN, HAROLD G. DIETRICH, FLORENCE FENWICK, ARTHUR FLEISCHER, GEORGE L. FREAR, ELLIOTT J. ROBERTS, RODNEY P. SMITH, MYER SOLOMON AND HAROLD M. SPURLIN

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INTRODUCTION

This section includes systems in which one component only, the solvent, is appreciably volatile or in which the necessary correction has been made for the small vapor pressure of the solute or solutes. The data represent elevations of the boiling point at temperatures at which the vapor pressure of the solvent is equal to the constant external pressure; whenever possible the elevations have been corrected to normal atmospheric pressure. (For method, *v.* (234).)

In the following tables:

 Δt_B = boiling-point elevation for normal atmospheric pressure. T_B = normal boiling point of solvent, absolute scale.

i = the mole number, or the total number of ions and molecules per formula weight of solute in a binary system, or the corresponding number in a system of more than two components.

 x_1 = mole fraction of solute.

N = formality of solute or the gram-formula-weights per kg of solvent.

† = saturated solution.

For binary systems:

$$k_B = \lim_{x_1 \rightarrow 0} \frac{i \Delta t_B}{x_1}$$

For systems of more than two components:

$$k_B = \lim_{x \rightarrow 0} \frac{i \Delta t_B}{\Sigma x}$$

The latent heat of vaporization of the pure solvent, per gram-formula-weight may be computed from the relation

$$L_v = \frac{RT_B^2}{k_B} = 8.315 \frac{T_B^2}{k_B}, \text{ in joules} = 1.9869 \frac{T_B^2}{k_B}, \text{ in cal}_{15}.$$

TWO-COMPONENT SYSTEMS

The solvent is an elementary substance

The systems are arranged in order of the solvent following the A-arrangement. Under each solvent the solutes follow the Standard, resp., C-arrangement; *v. p.* viii.

Br ₂		SbBr ₅ (24)		Al ₂ Br ₆ (24)	
$T_B = 331.9$		N		N	$\frac{\Delta t_B}{x_1}$
$k_B = 33.0$		$\frac{\Delta t_B}{x_1}$		0.05	33.3
S ₂ (32)		0.05	32.4	0.1	32.3
N	$\frac{\Delta t_B}{x_1}$	0.1	32.2	0.15	31.3
0.05	31.2	0.15	32.0	0.2	30.4
0.1	30.9	SnBr ₄ (24)		Cl ₂	
0.15	30.8	0.05	33.1		
Se (32)		0.1	33.3		
AsBr ₃ (24)		0.15	33.5		
		0.2	33.6		
0.05		CBr ₄ (24)		$T_B = 238.5$	
		0.05	32.4	$k_B = 23.3$	
0.1	32.6	0.08	32.1	S (27, 126)	
0.15	32.8	C ₇ H ₅ BrO ₂ (24)		SCl ₂ (27, 41)	
0.2	33.1	<i>m</i> -Bromobenzoic acid		0.1	22.6
		0.04	21.9	0.2	22.9
				0.3	23.3
				0.5	23.9

S₂Cl₂ (27, 41)		SbI₅ (36)		CsI (36)		Pb(NO₃)₂ (68, 199)		Cu(C₂H₃O₂)₂ (92)		AlCl₃ (53, 90)	
<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	24.8	0.01	42.5	0.01	42.9	0.5	55.4	1.1	57.7†	0.5	91
0.2	23.3	0.04	40.9	0.02	40.0	1.0	52.7			1.0	98
0.25	22.2	0.05	40.3	0.03	37.4	2.0	49.9	Ag₂SO₄ (250)		2.0	114
CCl₄ (27)				0.04	35.4	3.0	49.1	AgNO₃ (122, 199)		4.7	167
0.15	23.8	BiI₃ (36)		0.05	33.6	3.5	48.8	0.1	51.3	Al₂(SO₄)₃ (10, 77)	
0.2	23.8	0.01	43	0.06	32.3	Pb(C₂H₃O₂)₂ (90)		0.5	48.4	1.0	95
0.25	23.9	0.02	41	O₂		<i>x</i> ₁	$\frac{\Delta t_B}{x_1}$	1.0	45.6	3.0	140
0.3	24.0	SnI₄ (36)		$T_B = 90.1$		0.1	23	2.0	42.8	(NH₄)₂SO₄ -	
C₂Cl₆ (27, 126)		0.02	39.1	$k_B = 8.2$		0.3	26	3.0	40.7	Al₂(SO₄)₃ (161)	
0.05	23.2	0.05	39.4	C₂H₄, Ethylene (104)		0.5	29	5.0	37.6	4.38	145†
0.1	23.4	0.1	39.9	C₂H₆, Ethane (104)		0.7	32	8.0	35.1	MgCl₂ (90, 122, 198)	
0.2	23.8	0.12	40.0	2.17	9.0	0.9	33	MnCl₂ (189)		0.1	67.4
0.25	24.0			3.71	9.6	TiCl₃ (54)		0.3	74.2	0.2	66.4
I₂		Fe₃I₆ (36)		S₈		<i>N</i>	$\frac{\Delta t_B}{x_1}$	0.6	75.5	0.5	72.6
$T_B = 457.5$		0.015	41.4	(partially dissociated)		0.1	53.6†	1.0	78.8	1.0	90.4
$k_B = 43$		0.02	41.3	$T_B = 717.7$		Tl₂SO₄ (54)		MnSO₄ (90, 122)		2.0	125
S (37)		0.025	41.1	$k_B = 60$		0.365	48.4†	0.3	25.4	4.0	193
Se (37)		Al₂I₆ (36)		Se (42)		TiNO₃ (54)		0.7	22.8	6.0	262
0.05	28.4	0.05	38.8	0.1	26.0	ZnCl₂ (53)		1.0	22.2	MgSO₄ (122)	
0.1	26.3	0.1	36.2	0.2	26.6	0.17	49.5	1.5	23.9	0.5	21.7
0.2	24.9	0.15	33.7	0.3	27.3	ZnSO₄ (90, 122)		3.0	29	1.0	18.4
0.3	24.1	KI (36)		0.5	28.7	0.5	23.1	4.5	32	2.0	14.0
Te (37)		0.02	33.0	Te (42)		1.0	23.5	FeSO₄ (122)		4.0	25.5
0.06	30.7	0.04	32.3	0.1	47.9	1.5	25.1	1.0	22.6	6.0	36.6
0.08	29.7	0.05	32.0	0.2	48.9	2.5	32.9	1.5	22.6	CaCl₂	
0.1	28.7	0.06	31.7	0.3	49.9	4.0	48	2.0	25.1	(11, 90, 111, 198)	
0.12	27.9	RbI (36)		As (42)		5.3	57†	2.3	27.3	0.1	66.8
P (red) (37)		0.02	35.5	0.06	65	CdCl₂ (110)		CoCl₂ (53)		0.2	65.6
0.05	39.2	0.04	32.3	0.1	64	0.8	35	0.2	67.8	0.5	71.9
0.1	40.1	0.05	31.0	0.2	62	2.0	33	0.4	70.9	1.0	87.8
0.12	40.5	0.06	30.2	As₂S₃ (42)		3.0	31	0.7	73.6	5.0	183
		0.08	29.3	Sb₂S₃ (42)		CdI₂ (18, 110)		CoBr₂ (107)		7.0	208

The solvent is a chemical compound

The systems are arranged in order of the solvent following the Standard arrangement. Under each solvent, the solutes follow the Standard, resp., C-arrangement; v. p. viii.

AQUEOUS SOLUTIONS

H₂O		NH₄Cl (90, 108)		(NH₄)₂SO₄ (68, 90, 110)	
$T_B = 373.1$		<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$
$k_B = 28.9$		0.6	51.6	0.6	47
HIO₃ (12, 182)		1.0	51.7	1.0	48
<i>N</i>	$\frac{\Delta t_B}{x_1}$	1.5	52.2	2.0	49
0.2	39.7	2.0	53.2	3.0	52
0.5	34.1	5.0	56	4.0	54
1.7	26	10.0	62	6.0	58
H₂SO₄ (70)		16.3	65†	8.3	62†
<i>x</i> ₁	$\frac{\Delta t_B}{x_1}$	NH₄Br (108, 110, 111)		H₃PO₃ (183)	
0.06	87.7	1.0	52.9	0.3	35.4
0.1	108.4	1.5	54.0	0.5	32.4
0.2	160.5	2.0	55.0	1.0	29.5
0.3	212.7	5.0	56.6	H₃AsO₃ (55)	
NH₄NO₃ (90)		10.0	59.2	0.1	28.4
0.1	48	15.0	61.8	0.15	27.8
0.2	51	18.0	63.3	0.2	27.3
0.3	54	NH₄I (108, 110)		For C-compounds belonging here, v. C-Table, p. 326.	
0.4	57	0.6	52.6	SnCl₂ (53)	
0.5	61	1.0	53.7	0.18	50.5
0.6	66	1.5	55.0		
0.7	74	2.0	56.3		
0.8	86	5.0	62.7		
0.84	94	9.0	69		

H₂O.—(Cont'd)		Li₂SO₄ (111)		Na₂SO₄—(Cont'd)		Na₂SiF₆ (262)		KNO₃—(Cont'd)		K₂Cr₂O₇ (12, 130)	
Sr(NO₃)₂ (54, 68, 199)		N		N		Na₂B₄O₇ (90)		N		N	
$\frac{\Delta t_B}{x_1}$		$\frac{\Delta t_B}{x_1}$		$\frac{\Delta t_B}{x_1}$		$\frac{\Delta t_B}{x_1}$		$\frac{\Delta t_B}{x_1}$		$\frac{\Delta t_B}{x_1}$	
0.5	66.8	1.0	50.2	1.5	61.3	0.5	65	2.0	47.1	0.2	72.0
1.0	68.9	2.0	51.3	2.0	59.8	1.0	66	5.0	44.2	0.3	70.6
2.0	72.9	3.0	52.6	2.96	56.8†	2.0	62	10.0	40	0.4	70.9
3.0	77	4.0	50.4	Na₂S₂O₃ (90)		3.0	58	25.0	39	3.65	78†
4.0	81	LiNO₃ (110)		5.0	87	5.0	52	36.7	39.0	K₂SO₄.CuSO₄ (92)	
4.8	86†	0.5	40.5	10.0	101	KOH (90)		K₂CO₃ (90, 115, 141)		K₂SO₄.Al₂(SO₄)₃ (90)	
Ba(OH)₂ (15)		1.0	40.6	15.0	101	$\frac{\Delta t_B}{x_1}$		0.1	56.7	0.5	92
7.0	26	2.0	42.6	22.0	92†	0.1	100	0.4	52.8	1.0	113
8.0	36	5.0	49.8	NaNO₃		0.2	154	1.0	61.0	1.5	135
9.0	46	7.0	54.0	(54, 90, 141, 199)		0.3	225	2.0	77.0	2.0	157
10.0	50	9.0	58	0.1	52.1	0.4	283	5.0	102	2.2	164
11.0	51	Li₂CO₃ (250)		0.5	50.1	0.5	319	10.0	145	KNaC₄H₄O₆	
BaCl₂ (122)		LiC₇H₅O₃ (192)		1.0	50.1	0.6	343	15.0	164	(90, 128)	
0.5	70.5	Salicylate		5.0	54	0.66	358	K₂C₂O₄ (128, 131)		0.5	64.0
1.0	76.7	0.3	52.3	10.0	57	KCl (54, 90, 108)		Oxalate		1.0	63.4
1.5	83.2	1.0	49.6	15.0	59	N		0.3	65.8	2.0	62.1
2.0	89.6	1.2	49.2	24.86	65.3†	$\frac{\Delta t_B}{x_1}$		4.77	79†	3.0	60.8
2.5	96	NaOH (90, 148)		Na₂HPO₄ (90)		0.1	57.8	KC₂H₃O₂ (141)		10.0	79
Ba(ClO₃)₂ (207)		$\frac{\Delta t_B}{x_1}$		0.1	47	0.3	52.3	Acetate		30.0	82
3.66	86†	0.01	54.2	0.3	48	0.5	52.3	$\frac{\Delta t_B}{x_1}$		50.0	83
BaBr₂ (111)		0.1	79	0.5	50	1.0	54.1	0.02	53	RbCl (54, 57)	
1.0	85.3	0.2	112	0.8	53	2.0	55.0	0.05	60	0.1	52.3
2.0	117	0.3	136	Na₂CO₃ (115, 141)		5.0	63	0.1	78	0.3	50.8
3.0	129.3	0.4	148	0.1	73.3	7.82	69.6†	0.2	100	0.5	50.7
4.0	135	0.5	157	0.5	60.1	KClO₃ (122, 141)		0.3	108	1.0	51.6
5.0	139	0.6	164	1.0	53.4	0.5	59.6	0.5	113	2.0	52
Ba(BrO₃)₂ (207)		0.7	170	2.0	50.1	1.0	55.0	KH₃(C₂O₄)₂ (131)		5.0	62
Ba(IO₃)₂ (207)		0.8	180	3.0	48	2.0	51.2	Trihydrogen dioxalate		12.17	75.1†
BaS₂O₆ (241)		0.9	195	4.0	55	3.0	50.0	N		Rb₂SO₄ (54)	
Ba(NO₃)₂ (68, 199)		NaCl		NaC₂H₃O₂		4.0	51	$\frac{\Delta t_B}{x_1}$		3.11 | 66.2†	
0.1	66.7	(54, 57, 90, 108, 199)		Acetate		5.0	51	3.31	61†	RbNO₃ (54)	
0.3	62.9	N		(18, 90, 192)		KBr (108, 122)		K₂C₄H₄O₆ (90)		43.34 | 44.3†	
0.5	60.7	0.5	53.3	0.2	51.1	0.5	52.7	Tartrate		CsCl (54, 68)	
0.9	57.7	1.0	54.7	0.5	50.1	1.0	54.1	1.0	75	0.5	53.4
1.33	54.8	2.0	58.7	1.0	53.1	1.5	55.7	2.0	77	1.0	50.7
LiCl		3.0	63	2.0	57.5	2.0	57.9	4.0	81	2.0	52.3
(57, 90, 110, 111)		4.0	67	5.0	70	4.0	65.4	6.0	85	3.0	55.8
0.5	58.3	5.0	72	10.0	82	4.3	66.7	8.0	88	4.0	59.5
1.0	56.2	6.78	79.6†	15.0	83	KI (90, 108, 122)		10.0	90	5.0	63.1
2.0	56	NaClO₃ (72)		25.2	80†	0.2	51.6	10.9	90†	17.2	84.2†
5.0	80	10.0	58	NaC₃H₅O₂ (134)		0.5	53.0	KHC₂O₄ (131)		Cs₂SO₄ (54)	
10.0	120	15.0	59	Propionate		1.0	55.4	Hydrogen oxalate		6.3 | 98.2†	
15.0	150	20.0	62	0.5	53.6	2.0	60.4	KHC₄H₄O₆ (1)		CsNO₃	
20.0	170	26.86	67†	1.0	56.0	5.0	74.5	Hydrogen tartrate		(54, 110)	
30.0	170	NaBr (108, 111)		2.0	61.8	10.0	87	K₂C₂₈H₂₂N₄O₈S₂		0.5	50.5
35.0	170	0.5	56.0	Na₂C₄H₄O₆ (90)		13.3	96†	Chrysophenine		1.0	47.2
LiBr (110, 111)		1.0	56.5	Tartrate		KIO₃ (182)		K₂C₃₄H₂₆N₆S₂O₆		11.5	42.2†
0.5	60.2	2.0	57.5	1.0	63	0.3	46.7	Benzopurpurin 4B		Cs₂SO₄.Al₂(SO₄)₃	
1.0	59.1	10.0	76	2.0	64	0.5	45.5	(127)		(54)	
2.0	65.3	NaI (108, 111, 192)		4.0	67	1.0	42.5	KSbOC₄H₄O₆ (14)		0.325 | 68.9†	
5.0	95	0.2	53.2	6.0	69	KH(IO₃)₂ (182)		Antimonyl tartrate		C-TABLE, THE C-	
10.0	158	0.5	55.5	7.5	70†	0.2	98	0.03 | 28		ARRANGEMENT	
15.0	184	1.0	59.1	NaC₇H₅O₃ (192)		0.6	96	0.06 | 30		CH₄N₂O	
17.0	191	2.0	66.4	Salicylate		0.5	59.4	0.12 | 31		Urea	
LiI (111)		5.0	87.4	0.1	49.1	1.0	57.4	KCN (92)		(139, 152, 201, 231)	
0.5	48.3	10.0	120.8	0.5	50.3	1.39	56.9†	K₃Fe(CN)₆ (232)		N	
1.0	48.9	NaIO₄ (182)		0.8	51.3	KNO₂ (172)		2.5 | 103		$\frac{\Delta t_B}{x_1}$	
2.0	53.0	Na₂SO₄ (115)		Na₂O + SiO₂ (71)		55.6	60†	K₂CrO₄ (12, 130)		0.5	26.9
5.0	65	0.1	58.4	0.5	51	KNO₃		0.3	63.3	1.0	27.4
9.0	81	0.5	59.2	1.0	43	(54, 90, 122, 199)		0.5	63.4	1.5	27.8
		1.0	60.3			0.5	50.0	1.0	64.1	2.5	28.6
						1.0	48.5	1.5	65.3		
								4.57	76†		

CH₃CIN (133) Methylammonium chloride		C₃H₇NO₂ (154) Lactamide		C₄H₁₂CIN.—(Cont'd)		C₆H₆O₃ (175) Phloroglucinol		C₇H₆O₂ (175) Benzoic acid		C₈H₈O₂ (196) <i>o</i> -Toluic acid	
<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	54.2	0.75	27.5	1.0	48.7	0.4	21.7	0.5	14.8	0.24	24.8†
0.3	54.7	1.0	27.4	1.2	47.9	0.6	23.2	0.6	13.4		
0.5	55.7	1.5	27.2			0.8	23.2				
0.8	57.8			C₄H₁₂CIN (214)				C₇H₆O₃ (175)		C₈H₈O₃ (196)	
1.0	60.0	C₃H₇NO₂ (201)		Diethylammonium chloride		C₆H₆O₃ (175, 185)		<i>m</i> -Hydroxybenzoic acid		2-Hydroxytoluene-4-carboxylic acid	
1.1	60.9	Urethane		C₅H₁₁NO (154)		Pyrogallol		0.35	25.1	0.35	27.5†
		0.2	14.0	Valeramide		0.5	26.7	0.45	24.0		
		0.3	14.4	0.5	23.5	0.7	26.3	0.55	22.9	C₈H₈O₃ (175)	
		0.5	14.7	0.6	23.0	1.0	25.6			Mandelic acid†	
		0.7	14.6	0.7	22.5	1.5	24			0.3	27.8
		C₃H₈O₃ (89)		0.8	22.0	2.0	22	C₇H₆O₃ (175, 196)		0.45	27.6
		Glycerol		0.9	21.5			<i>p</i> -Hydroxybenzoic acid			
		<i>x</i> ₁	$\frac{\Delta t_B}{x_1}$	C₆H₃N₃O₇ (128)		C₆H₈O₇ (12, 90, 120)		0.3	28.1	C₈H₉NO (152)	
		0.02	43	Picric acid		Citric acid		0.4	26.5	Acetanilide	
		0.05	38	0.1	52	0.5	31.8	0.5	25.0	0.3	19.0
		0.1	35	C₆H₅NO₃ (175)		1.0	32.6	2.43	22†	0.4	17.9
		0.2	39	<i>p</i> -Nitrophenol		2.0	34.9			0.45	17.3
		0.3	43	0.16	25.2	5.0	42.5	C₇H₆O₃ (175)			
		0.4	47	0.2	23.6	10.0	55	Salicylic acid		C₈H₉NO (154)	
		0.5	51	0.3	21.3	20.0	63	0.3	22.2	Phenylacetamide	
		0.6	58	0.4	20.2	50.0	65	0.4	19.8	0.4	24.6
		0.7	69			70.0	65	0.55	16.4	0.5	22.8
		C₄H₆NO₂ (201)		C₆H₆O (84)		C₆H₁₂O₆ (120)		C₇H₆O₄ (175)		0.9	18.7
		Succinimide		Phenol		<i>d</i> -Glucose		3,4-Dihydroxybenzoic acid			
		<i>N</i>	$\frac{\Delta t_B}{x_1}$	0.2	32	0.2	30.0	0.3	23.5	C₈H₉NO₂ (154)	
		0.2	26.8	0.3	32	0.5	30.0	0.7	22.9	Glycolanilide	
		0.5	27.5	C₆H₆N₂O₂* (175)		1.0	30.0			0.3	24.7
		0.7	27.9	<i>m</i> -Nitroaniline		2.0	30.0	C₇H₆O₅ (128)		0.4	23.2
		1.0	28.1	1.2	22.1	3.0	30.0	Galic acid		0.5	22.2
		1.3	27.2	1.4	22.3			0.2	28.0		
		C₄H₆O₄ (12, 175)		1.6	22.6	C₆H₁₂O₆ (120)		0.4	26.1	C₈H₁₂CIN (214)	
		Succinic acid		C₆H₆O₂ (175, 185)		Fructose		0.6	25.4	Ethylphenylammonium chloride	
		0.5	28.0	Catechol		0.5	30.3	C₇H₇NO (152)		C₈H₂₀BrN (214)	
		1.0	27.5	0.3	24.9	1.0	30.2	Benzamide		Tetraethylammonium bromide	
		2.0	27.3	0.4	24.8	2.0	30.2	0.75	20.8	0.13	51.7
		2.5	27.2	0.5	24.7	2.5	30.5	1.0	19.8		
		C₄H₆O₆ (12, 90, 110, 120)		1.0	22	3.0	31.3	1.25	19.2	C₈H₂₀CIN (214)	
		Tartaric acid		1.5	20	C₆H₁₃NO (154)		C₇H₇NO (154)		Tetraethylammonium chloride	
		0.5	30.8	2.0	17	Isobutylacetamide		Formanilide			
		1.0	31.7	C₆H₆O₂ (175, 185)		0.55	19.7	0.4	21.2	C₈H₂₀IN (214)	
		3.0	35.7	Hydroquinol		0.65	18.3	0.6	19.5	Tetraethylammonium iodide	
		5.0	39.4	0.4	27	C₆H₁₄O₆ (18, 139, 201)		0.75	17.9	0.25	44.4
		20.0	61	0.6	25	Mannitol		C₇H₇NO₂ (152)		0.3	42.9
		50.0	73	0.8	25	0.2	27.9	Salicylamide		0.35	43.9
		100.0	75	1.0	24	0.5	28.1	0.7	18.1		
		200.0	74	1.5	22	1.0	28.6	1.0	15.8	C₉H₁₁NO (154)	
		C₄H₉NO (154)		2.0	21	1.2	29.1	C₇H₈N₂O (154)		Methylacetanilide	
		<i>n</i> -Butyramide		C₆H₆O₂ (175, 185, 201)		C₆H₁₆BrN (214)		Phenylurea		C₉H₁₁NO₂ (154)	
		0.5	25.5	Resorcinol		Triethylammonium bromide		0.2	27.4	Lactanilide	
		0.6	25.0	0.4	26.6	C₆H₁₆CIN (214)		0.3	25.8	0.4	23.7
		0.7	24.4	0.5	26.1	Triethylammonium chloride		0.4	24.3	0.5	22.3
		0.8	23.9	0.7	25.0	C₆H₁₆IN (214)		C₇H₉N (84)		0.65	20.7
		C₄H₉NO (154)		1.0	24	Triethylammonium iodide		Benzylamine			
		Isobutyramide		1.5	22	0.25	55	0.1	26.3	C₁₀H₆N₂O₈S (127)	
		0.55	24.1	2.0	21	0.5	48	0.2	28.0	2, 4-Dinitro-1-naphthol-7-sulfonic acid	
		0.65	23.7	C₆H₆O₃ (185)		C₇H₅ClO₂ (196)		0.3	30.7	naphthol yellow S)	
		0.75	23.6	Hydroxyhydroquinol		<i>m</i> -Chlorobenzoic acid		0.35	32.3	C₁₁H₁₂IN (214)	
		C₄H₁₂CIN (214)		0.5	27	acid		C₈H₆O₄ (175)		<i>N</i> -Ethylquinoline iodide	
		Isobutylammonium chloride		1.0	26	C₇H₅NO₄ (196)		Phthalic acid			
		0.3	55.3	1.5	25	<i>o</i> -Nitrobenzoic acid		0.35	36.8		
		0.5	51.0	1.9	24	77.2	29.2†	0.55	34.9		
		0.8	49.4					C₈H₈O₂ (175)			
								Phenylacetic acid			
								0.4	20.8		
								0.7	16.9		

* Uncorrected for partial pressure of solute.
† The isomer used is not given.

H₂O.—(Cont'd)
C₁₂H₂₂O₁₁ (120, 122)

Sucrose	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.5	29.9
1.0	31.3
2.0	34.0
3.0	38.3
4.0	43.0
5.0	46.2
6.0	49.0
7.0	50.9
8.5	54.0

C₁₂H₂₈IN (214)
Tetrapropyl-
ammonium iodide**C₁₂H₂₈N₂O₃ (214)**
Tetrapropyl-
ammonium nitrate

C₂₃H₂₈N₂O₇ (150) <i>d</i> -Cinchonine hydrogen tartrate	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	40.0

C₂₃H₂₈N₂O₇ (150)
l-Cinchonine
hydrogen tartrate

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	42.0
0.2	40.2

C₃₇H₂₉N₃O₉S₃ (127)
Triphenylpararos-
aniline trisulfonic
acid (soluble blue)**C₆H₄Cl₂ (40)**
p-Dichlorobenzene

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	23.1
0.3	22.9
0.4	22.8
0.5	22.9

C₆H₁₆CIN (229)
Triethylammonium
chloride

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	24.1
0.2	24.2
0.3	24.4
0.5	24.7

C₇H₆O₂ (40)
Benzoic acid

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	13.1
0.2	13.0
0.3	12.9
0.4	12.8
0.5	12.7
0.6	12.5

C₇H₈ (219)

Toluene	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.5	24.7
1.0	26.5
1.5	28.7

C₇H₁₀CIN (229)
Benzylammonium
chloride

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.3	12.4
0.4	11.9
0.5	11.5
0.6	11.3

C₈H₉NO (219)

Acetanilide	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	23.6
0.07	24.5

C₈H₂₀IN (229)
Tetraethyl-
ammonium iodide

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	26.9
0.1	28.2
0.15	29.6
0.2	30.8
0.25	32.1

C₁₀H₈ (219)

Naphthalene	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.3	23.8
0.5	23.9

C₁₂H₂₂O₆ (229)
Isobutyl tartrate

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	24
0.2	24
0.3	30

C₁₄H₁₀O₃ (40)
Benzoic anhydride

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	22.5
0.1	23.6
0.15	24.7

C₁₆H₁₁N₃O₈ (229)
 β -Naphthol picrate

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.035	48.5
0.065	48.3

C₁₉H₁₆ (229)
Triphenylmethane

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	22
0.4	22
0.6	22.4

NaI (219)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.27	13.5

KI (40, 219, 229)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	16.0
0.5	12.1
0.8	12.0
1.0	12.6
1.4	14.7
1.7	19.6
2.0	26.1

KCNS (40, 219)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	16.5
0.3	12.7
0.5	11.4
1.0	10.9
2.0	15.5
3.0	28.5

RbI (229)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.3	14.9
0.5	13.3
0.7	12.6

SO₃

$T_B = 317.7$
 $k_B = 14.0$

H₂SO₄ (38)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	18.3
0.1	17.0
0.2	14.8
0.5	11.4
1.0	9.8
1.5	10.4
2.0	12.1
2.2	13.3

C₇H₁₆O₄S₂ (38)

Sulfonal	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	15.2
0.1	16.5
0.2	19

C₈H₁₈O₄S₂ (38)

Trional	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	15.6
0.1	17.2
0.15	18.8

H₂S

$T_B = 213.5$
 $k_B = 23$

C₇H₈ (50, 149)

Toluene

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.3	22.5
0.5	22.0
1.0	22.6
1.5	19.3
2.0	17.8

C₆H₁₆CIN (149)
Triethylammonium
chloride

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.25	27.9
0.5	32.5

H₂SO₄*

$T_B = 60.4$

$k_B = 60$

As₂O₃ (25)**Mo₂O₆ (25)**

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	62
0.1	59
0.15	55

B₄O₆ (25)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	56
0.1	54
0.15	52
0.2	50

Na₂SO₄ (25)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.08	65
0.1	66
0.15	70
0.19	73

Na₂S₂O₇ (25)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.08	55
0.1	58
0.13	63

K₂SO₄ (25)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	70
0.18	74

K₂S₂O₇ (25)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	64
0.15	66
0.2	68

KHSO₄ (25)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	30
0.3	31
0.4	33

* Constant boiling
Ca. 98.3 % H₂SO₄ by
weight. Partially dis-
sociated.

S₂Cl₂

$T_B = 411$

$k_B = 36.3$

S (27)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.4	34.4
0.6	24.7
1.0	21.9
2.0	19.0
2.5	18.3
5.5	20.6

Se (27)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	45.6
0.3	44.8
C₁₄H₁₀ (27) Anthracene	
0.15	37.8
0.25	38.8

SO₂Cl₂

$T_B = 342.2$
 $k_B = 34.5$

I₂ (97)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	29
0.1	28

Al₂Cl₆ (38)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	49.6
0.1	49.1
0.13	49.2

NON-AQUEOUS SOLUTIONS

The solvent is an inorganic compound

Standard arrangement. Under each solvent, the solutes are in the Standard, resp., C-arrangement; v. p. viii.

HCl

$T_B = 188.1$
 $k_B = 18$

C₄H₁₀O (149)

Ethyl ether

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.5	14
1.0	22.4
1.5	33.0
2.0	43.6
2.5	58

C₇H₈ (50)

Toluene

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.276	18

HBr

$T_B = 206.1$
 $k_B = 24$

C₃H₆O (149)

Acetone

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.5	14.0
0.75	17.7
1.0	23.4
1.25	30.7

C₄H₁₀O (149)

Ethyl ether

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.5	24.9
0.75	29.3
1.0	36.0
1.25	44.6

C₇H₈ (50, 149)

Toluene

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.075	23
0.15	21
0.5	27.4
0.75	27.5

HI

$T_B = 237.4$
 $k_B = 26$

C₇H₈ (50)

Toluene

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	26
0.08	26

SO₂

$T_B = 263.1$
 $k_B = 22.9$

SCl₂ (40)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	10.4
0.2	10.4

SCl₂—(Cont'd)

$T_B = 188.1$
 $k_B = 18$

C₄H₁₀O (149)

Ethyl ether

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.3	10.5
0.4	10.7

S₂Cl₂ (40)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	21.7
0.3	21.4
0.4	22.1

NH₄I (219)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	14.3
0.3	13.1
0.4	12.0
0.5	11.1
0.6	10.5
0.7	10.0

NH₄CNS (229)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.5	8.4
1.0	6.8
2.0	7.5
3.0	12.6
4.0	23.0

CH₃CIN (229)

Methylammonium
chloride

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	10.8
0.3	9.6
0.4	8.7

C₂H₄O₂ (40)

Acetic acid

<i>N</i>	$\frac{\$
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C₇H₁₆O₄S₂ (38) Sulfonal	C₆H₄N₂O₅ (86) 2, 4-Dinitrophenol	NH₃ $T_B = 239.7$ $k_B = 20.2$ H₂O (87)	C₆H₆O.—(Cont'd)	PCl₃ $T_B = 346.6$ $k_B = 33.9$ AsI₃ (27) SbI₃ (27) C₁₄H₁₀ (27) Anthracene	FeCl₂ (186)
N $\frac{\Delta t_B}{x_1}$	N $\frac{\Delta t_B}{x_1}$	N $\frac{\Delta t_B}{x_1}$	N $\frac{\Delta t_B}{x_1}$	N $\frac{\Delta t_B}{x_1}$	N $\frac{\Delta t_B}{x_1}$
0.05 34.5	0.05 15.3	0.5 20.6	2.0 18.1	0.025 34.2	0.05 56.0
0.1 34.5	0.1 15.5	1.0 20.7	3.0 17.4	0.05 34.5	0.1 57.0
0.15 34.4	C₆H₄O₂ (86) Quinone	2.0 20.9	C₆H₆O₂ (87) Catechol		CoCl₂ (186)
0.2 34.1	0.2 15.0	3.0 21.1	0.5 19.3		0.05 59.0
C₈H₁₈O₄S₂ (38) Trional	0.3 15.5	5.0 21.5	1.0 19.3		CaCl₂ (186)
0.05 36.3	C₆H₅NO₂ (86) Nitrobenzene	7.0 22.3	2.0 19.3		0.02 51.5
0.1 36.3	0.2 14.3	10.0 25	2.5 19.3		0.03 51.3
0.2 36.3	0.4 14.6	NH₄NO₃ (87)		SnI₄ (27)	SrCl₂ (186)
C₁₀H₁₆O (38) Camphor	0.8 15.3	0.5 21.0	C₆H₆O₂ (87) Hydroquinol		0.03 53.7
0.05 35.9	1.0 15.6	1.0 21.9	0.5 22	AsCl₃ $T_B = 395$ $k_B = 40.1$	0.05 54.1
0.1 34.2	1.5 16.4	2.0 24.3	1.0 23	S₈ (rhombic) (27)	BaCl₂ (186)
0.15 34.0	1.8 17.0	3.0 28.2	1.5 23	0.08 38.5	0.04 55.3
0.2 34.0	C₇H₆O₂ (86) Benzoic acid	4.0 32.8	2.0 25	0.1 38.6	0.05 55.5
0.25 34.0	0.4 8.2	CH₄N₂O (87) Urea		0.15 39.0	0.07 55.9
N₂O₄ $T_B = 294.4$ $k_B = 14.2$	0.6 8.4	0.5 19.4	C₆H₆O₂ (87) Resorcinol	S₈ (monoclinic) (27)	0.1 56.8
C₂HBr₃O₂ (86) Tribromoacetic acid	0.8 8.5	1.0 18.9	0.5 21.1	0.05 43	LiCl (186)
0.1 7.6	C₇H₇Cl (86) Benzyl chloride	2.0 17.8	1.5 21.1	0.1 42.1	0.07 53.0
C₂H₂Br₄ (86) 1, 1, 2, 2-Tetra- bromoethane	0.2 16.1	3.0 16.7	2.0 21.1	0.14 41.2	0.13 56.0
0.2 16.3	0.4 16.3	4.0 15.6	C₆H₇N (87) Aniline	As₂O₃ (27)	NaCl (186)
0.3 16.2	0.6 16.4	C₂H₆O (87) Ethyl alcohol	0.5 20.1	AsI₃ (27)	0.05 53.0
0.4 16.1	0.8 16.5	0.5 19.8	1.0 19.9	SbI₃ (27)	0.1 54.0
0.5 15.9	1.0 16.7	1.0 20.1	1.5 19.7	C₁₄H₁₀ (27) Anthracene	KCl (186)
C₂H₄Br₂ (86) Ethylene bromide	1.2 16.8	2.0 20.4	3.0 19.5	0.03 40.2	0.07 58.0
0.2 16.4	1.4 16.9	3.0 20.8	3.5 19.4	0.06 40.4	0.16 60.0
0.4 16.7	C₇H₇NO₂ (86) <i>p</i> -Nitrotoluene	5.0 21.5	C₁₂H₂₂O₁₁ (87) Sucrose	0.09 41.0	RbCl (186)
0.6 16.6	0.1 14.3	7.0 22.2	0.5 21	SnI₄ (27)	0.07 60.1
0.8 16.6	0.2 14.6	9.0 22.6	1.0 23		0.1 60.3
1.0 16.5	0.3 14.9	C₃H₈O (87) Propyl alcohol	1.5 26	BiCl₃ $T_B = 720$ $k_B = 54.7$	CsCl (186)
1.2 16.5	0.4 15.1	0.5 20.2	2.0 28	BiPO₄ (186)	0.05 56.0
1.6 16.4	0.5 15.4	1.0 19.9	Li (87)	PbCl₂ (186)	0.1 55.0
C₂H₄O₂ (86) Acetic acid	0.7 16.0	2.0 19.4	2.0 9.1	0.04 55.3	CuCl (186)
0.46 7.7	C₇H₈ (86) Toluene	3.0 19.0	3.0 7.7	0.07 55.0	0.04 52.0
C₄H₅Cl₃O₂ (86) Trichlorobutyric acid	0.2 15.3	5.0 18.6	3.5 7.5	ZnCl₂ (186)	0.1 54.0
0.1 11.3	0.4 15.9	7.0 18.7	4.0 7.7	0.05 54.7	0.16 56.0
0.2 11.0	0.6 16.2	9.0 18.8	4.5 8.4	0.07 54.4	CuCl₂ (186)
0.3 10.8	0.8 16.4	C₆H₅N (87) Pyridine	Na (87)	CdCl₂ (186)	0.05 56.0
C₆H₃N₃O₇ (86) Picric acid	1.0 16.5	0.5 18.9	0.5 14	0.05 56.0	0.1 55.0
0.1 15.7	1.2 16.6	1.0 18.2	1.0 13	0.1 55.0	CuCl₂ (186)
0.2 15.1	C₈H₈O (86) Acetophenone	2.0 17.1	2.0 10.0	0.16 56.0	0.05 60.0
0.3 14.6	0.3 15.2	3.0 16.3	2.5 8.7	AgCl (186)	0.07 60.4
0.4 14.1	0.4 15.5	5.0 15.0	NaNO₃ (87)	0.07 56.7	0.1 57.3
C₆H₄N₂O₄ (86) <i>m</i> -Dinitrobenzene	0.5 15.7	8.0 13.8	0.5 17.7	0.15 57.6	PtCl₂ (186)
0.1 14.5	0.6 15.9	C₆H₅NO₃ (87) <i>o</i> -Nitrophenol	1.0 19.8	PdCl₂ (186)	0.02 55.0
0.2 14.6	0.8 16.3	0.5 20.1	2.0 22.6	0.05 56.0	0.05 56.0
0.3 14.7	C₈H₈O₂ (86) <i>o</i> -Toluic acid	1.0 20.0	3.0 25.0	MnCl₂ (186)	0.03 54.0
0.4 14.8	0.2 8.9	1.5 19.8	4.0 29.2	0.07 57.0	0.07 57.0
0.5 14.9	0.4 8.8	C₆H₆ (87) Benzene	NaC₂H₃O₂ (87) Acetate	0.1 57.3	
0.7 15.2	0.6 8.8	0.6 15	0.1 22	0.15 57.6	
	C₈H₈O₂ (86) <i>m</i> -Toluic acid	0.8 15	0.3 16	CrO₂Cl₂ $T_B = 449$ $k_B = 35$	
	0.1 9.1	1.0 14.8	0.4 13	0.02 55.0	
	0.2 9.0	1.3 14.5	K (109)	0.05 56.0	
	C₈H₈O₂ (86) <i>p</i> -Toluic acid	C₆H₆O (87) Phenol	KI (87)	0.02 57.0	
	0.1 10.5	0.5 19.6	0.5 21.4	0.05 56.0	
		1.0 19.1	1.0 23.8	0.03 54.0	
			2.0 28.6	0.07 57.0	
			3.0 34.0		
			3.5 36.5		

The solvent is an organic compound

The \mathcal{C} -arrangement. Under each solvent, the solutes are in the Standard, resp., \mathcal{C} -arrangement.

CCl₂O Phosgene $T_B = 281.4$ $k_B = 29$ I ₂ (40) ICl ₃ (40) N $\frac{\Delta t_B}{x_1}$ 0.02 32 0.03 31 0.035 30 SbCl ₅ (40) 0.05 24 0.1 23.4 0.2 23.4 0.3 23.4 0.35 23.4 S ₂ Cl ₂ (40) 0.1 30 0.15 29.8 0.2 29.8 AsCl ₃ (40) 0.2 28.6 0.5 28.9 0.7 29.1 SbCl ₃ (40) 0.02 27.6 0.06 27.2 0.1 26.8 0.14 26.5 SbCl ₅ (40) 0.02 27.8 0.05 28.0 0.1 28.2 0.12 28.3 C ₂ Cl ₆ (40) Hexachloroethane 0.05 30.5 0.1 30.7 0.2 31.1 0.25 31.3 C ₂ H ₄ O ₂ (40) Acetic acid 0.08 14.7 0.1 14.6 0.2 14.4 0.25 14.3 C ₄ H ₆ O ₃ (40) Acetic anhydride 0.05 29 0.08 28 0.1 28 0.15 27 C ₆ H ₄ Cl ₂ (40) p-Dichlorobenzene 0.05 27.5 0.1 27.8 0.2 28.2 0.3 28.6 C ₆ H ₄ Br ₂ (40) p-Dibromobenzene		C₆H₄Br₂—(Cont'd) N $\frac{\Delta t_B}{x_1}$ 0.05 32.1 0.1 32.0 0.2 31.8 0.3 31.5 C ₇ H ₆ O ₂ (40) Benzoic acid 0.05 14.7 0.1 14.1 0.13 13.7 C ₁₀ H ₈ (40) Naphthalene 0.05 31 0.1 31 0.15 30.6 0.2 30.5 C ₁₂ H ₁₀ (40) Diphenyl 0.05 28.5 0.08 28.6 0.1 28.7 0.15 28.8 C ₁₄ H ₁₀ O ₃ (40) Benzoic anhydride 0.02 32.0 0.05 30.6 0.1 28.6 C ₁₄ H ₁₄ (40) Dibenzyl 0.05 27.8 0.08 27.8 0.12 27.9 0.18 28.1 CCl ₄ $T_B = 349.9$ $k_B = 31.4$ I ₂ (30, 217) 0.05 32.4 0.1 32.4 0.2 32.5 0.46 30† S ₈ (168) 0.05 35.0 0.1 34.2 0.15 33.3 S ₂ Cl ₂ (164, 167) 0.1 31.4 0.2 31.4 0.3 31.5 0.4 31.5 N ₄ S ₄ (2) 0.05 33 POCl ₃ (164) 0.1 27.7 0.2 24.6 0.3 22 POBr ₃ (167) 0.1 34 0.15 33		PCl₅ (158) N $\frac{\Delta t_B}{x_1}$ 0.1 33.0 0.2 33.7 0.3 34.1 SbCl ₅ (159) 0.05 36.7 0.07 35.9 0.1 34.7 C ₂ H ₃ BrO ₂ (224) Bromoacetic acid 0.1 18.4 0.2 18.0 0.5 17.0 C ₅ H ₁₀ O ₂ (224) Isovaleric acid 0.2 17.8 0.3 17.8 0.5 17.8 C ₆ H ₆ O (46) Phenol 0.05 28 0.1 27 0.2 25 0.4 22 C ₇ H ₉ N (224) p-Toluidine 0.03 34.0 0.05 33.8 0.1 33.3 C ₉ H ₇ N (81) Quinoline 0.1 31 0.3 31.6 0.5 32.2 0.7 32.8 C ₉ H ₁₀ O ₂ (158) Ethyl benzoate 0.05 31.7 0.1 31.8 0.2 32.1 0.3 32.4 C ₉ H ₁₂ ClNO ₂ (224) p-Toluidine chloroacetate 0.05 33 0.1 31 C ₁₀ H ₈ (61) Naphthalene 0.05 31.6 0.1 31.7 0.2 31.9 C ₁₀ H ₁₀ O ₂ (81) Safrole 0.2 33.6 0.3 35.4 0.4 36.9 0.5 38.1 C ₁₀ H ₁₆ O (158) Camphor 0.15 31.7 0.25 32.1		C₁₂H₂₄O₂ (281) Lauric acid N $\frac{\Delta t_B}{x_1}$ 0.1 19 C ₁₃ H ₁₀ O ₂ (49) Phenyl benzoate 0.1 32.0 0.2 32.1 0.3 32.2 C ₁₃ H ₁₁ N ₃ O ₉ (224, 228) Dimethylpyrone picrate 0.01 56.8 0.02 51.2 C ₁₃ H ₁₃ NO ₃ (224, 228) Aniline salicylate 0.1 41.7 0.2 39.2 0.3 36.8 C ₁₄ H ₁₀ O ₂ (30) Benzil 0.05 32.3 0.1 32.4 0.2 32.5 0.3 32.6 C ₁₄ H ₁₅ NO ₃ (224, 228) p-Toluidine salicylate 0.05 45.8 0.1 42.2 0.2 36.6 C ₁₆ H ₁₆ (203) α , γ -Diphenyl- α , β -butene 0.05 32.5 0.1 32.4 0.15 32.2 C ₁₆ H ₁₆ (203) α , δ -Diphenyl- α , β -butene 0.05 32.8 0.1 32.8 C ₁₆ H ₃₂ O ₂ (218) Palmitic acid 0.03 21 0.05 21 C ₁₇ H ₁₂ O ₂ (166) β -Naphthyl benzoate 0.05 31 C ₁₇ H ₁₉ NO ₃ (81) Piperine 0.1 29.2 0.2 27.0 C ₂₁ H ₃₆ N ₄ O ₇ (224) Triamylammonium picrate 0.05 13 0.1 11.4 ZrC ₂₀ H ₂₈ O ₈ (60) Acetylacetonate 0.03 35.1 0.05 35.3		CrO₂Cl₂ (160) N $\frac{\Delta t_B}{x_1}$ 0.1 28.9 0.2 29.3 0.3 29.7 CS ₂ $T_B = 319.4$ $k_B = 31$ I ₂ (18, 136, 165, 168, 188, 217) 0.2 31 0.5 31 1.0 31 1.84 30† S ₈ (rhombic) (4) 0.1 30.2 0.2 30.0 0.5 29.2 0.8 28.5 1.0 28.0 S ₆ (E) (7) 0.1 31.6 0.15 31.0 0.2 30.5 P ₄ (yellow) (18, 98) 0.1 31.0 0.2 30.4 0.5 28.8 1.0 26.7 1.5 25.4 POCl ₃ (165, 167) 0.25 29.8 0.35 30.6 P ₄ S ₃ (98) 0.05 30.1 0.1 29.7 0.3 28.0 0.5 27.2 AsI ₃ (210) 0.1 32.5 0.2 31.0 SbI ₃ (210) 0.05 31.5 0.07 31.5 C ₄ H ₇ Cl ₃ O ₂ (65) Chloral alcoholate 0.3 14.0 C ₆ H ₅ ClO ₂ S (129) Benzenesulfone chloride 0.34 31.8 C ₇ H ₅ NS (18) Phenyl isothiocyanate 0.1 31.2 C ₇ H ₆ O ₂ Benzoic acid (18, 139, 180) 0.1 16.1 0.2 16.0 0.5 15.5 0.7 15.2 C ₈ H ₁₂ O ₆ (221) Dimethyl acetylmalate		C₈H₁₂O₆—(Cont'd) N $\frac{\Delta t_B}{x_1}$ 0.1 20.3 0.2 19.3 0.5 16.7 0.8 14.2 C ₈ H ₁₈ O ₄ S ₂ (83) Trional 0.05 32.0 0.1 32.3 C ₁₀ H ₈ Naphthalene (18, 139, 169, 224) 0.1 31.8 0.3 31.8 0.5 31.9 1.0 32.0 C ₁₀ H ₁₆ O (39) Camphor 0.1 30.0 0.2 30.0 0.5 30.0 C ₁₂ H ₁₀ N ₂ Azobenzene (76, 139, 180) 0.1 30.2 0.2 30.6 0.25 30.8 C ₁₂ H ₁₁ N (76, 139) Diphenylamine 0.1 29.8 0.2 30.2 0.3 30.7 C ₁₃ H ₁₀ O (18) Benzophenone 0.1 31.4 0.15 31.0 C ₁₃ H ₁₀ O ₂ (18, 83) Phenyl benzoate 0.05 32.1 0.1 31.4 0.2 30.1 0.3 28.8 C ₁₃ H ₁₀ O ₃ (83) Phenyl salicylate 0.05 32.4 0.1 32.5 0.2 32.8 C ₁₃ H ₁₃ NO ₃ (228) Aniline salicylate 0.03 58.4 0.05 54.6 C ₁₄ H ₁₀ (18) Anthracene 0.1 32.2 0.2 32.2 0.5 32.2 1.0 32.4 2.0 32.6 C ₁₄ H ₁₀ (83) Phenanthrene 0.05 31.7 0.1 33.0 0.15 34.4
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C₁₄H₁₀O₂ (39) Benzil	BeC₁₀H₁₄O₄— (Cont'd)	C₉H₅NO.— (Cont'd)	C₄H₁₀O₂S (225) Diethylsulfone	C₆H₁₅BrS (210) Triethylsulfonium bromide	C₇H₇NO₂ (152) Salicylamide
<i>N</i> | $\frac{\Delta t_B}{x_1}$	<i>N</i> | $\frac{\Delta t_B}{x_1}$	<i>N</i> | $\frac{\Delta t_B}{x_1}$	<i>N</i> | $\frac{\Delta t_B}{x_1}$	<i>N</i> | $\frac{\Delta t_B}{x_1}$	<i>N</i> | $\frac{\Delta t_B}{x_1}$
0.1 | 30	0.1 | 28.0	0.2 | 25.0	0.2 | 22.0	0.2 | 7.2	0.1 | 28.1
0.2 | 29	0.15 | 27.7	0.3 | 22.8	0.4 | 25.6	0.3 | 6.2	
		0.5 | 20.3	0.7 | 30	0.4 | 5.3	C₇H₉BrO₂ (225) Dimethylpyrone hy- drobromide
C₁₄H₁₂O₂ (83) Benzyl benzoate	CHCl₃ Chloroform <i>T_B</i> = 334.3 <i>k_B</i> = 32.0 <i>I₂</i> (30, 217)	C₂H₇NO₄S (225) Dimethylsulfoxide nitrate	C₄H₁₂CIN (210) Diethylammonium chloride	C₆H₁₅ClS (210) Triethylsulfonium chloride	0.2 | 21
0.3 | 31.5	0.05 | 30.5	0.2 | 43	0.1 | 14.1	0.2 | 8.5	0.3 | 18.7
0.5 | 32.6	0.1 | 30.5	0.3 | 37	0.2 | 13.3	0.3 | 8.0	0.4 | 17.2
0.7 | 33.8	0.2 | 30.8	0.4 | 30	0.3 | 12.5	0.35 | 7.5	
C₁₅H₁₂O₄ (83) Phenyl acetylsali- cylate	S₆ (204)	C₂H₈CIN (225) Dimethylammo- nium chloride	C₄H₁₂CIN (210) Isobutyl- ammonium chloride	C₆H₁₅IS (210) Triethylsulfonium iodide	C₇H₉N (201, 225) <i>p</i> -Toluidine
0.05 | 29.8	0.4 | 30.7	0.2 | 7.5	0.3 | 7.2	0.25 | 4.4	0.1 | 33.5
0.07 | 30.8	0.5 | 30.8	0.3 | 7.5	0.4 | 7.2	0.3 | 4.2	0.2 | 33.5
0.08 | 31.2	0.7 | 31.0	0.5 | 7.5	0.5 | 7.1	0.4 | 3.5	0.3 | 33.6
ThC₂₀H₂₈O₈ (58) Acetylacetone	0.9 | 31.3	C₃H₄Cl₃NO₂ (152) Trichlorolactamide	C₄H₁₂IN (210) Isobutyl- ammonium iodide	0.5 | 2.8	0.4 | 33.6
0.1 | 29.8	SOCl₂ (164, 167)	0.1 | 27.6	0.3 | 6.0	C₆H₁₆BrN (210) Triethylammonium bromide	0.5 | 33.7
0.2 | 29.3	0.1 | 33	0.2 | 23.2	0.4 | 5.4	0.2 | 19.6	
CrO₂Cl₂ (160)	0.2 | 28	0.25 | 21.1	0.5 | 4.8	0.3 | 18.0	C₇H₁₀BrN (225) Methylaniline hydrobromide
0.1 | 30.1	0.3 | 22	C₃H₇I (225) <i>n</i> -Propyl iodide	C₅H₁₀O₂ (225) Isovaleric acid	0.4 | 16.8	0.1 | 9.6
0.2 | 29.5	POCl₃ (164, 167)	0.1 | 33	0.5 | 19.0	0.5 | 15.8	0.2 | 10.0
0.3 | 28.9	0.1 | 30.6	0.3 | 33	0.7 | 19.7	C₆H₁₆CIN (210) Dipropyl- ammonium chloride	0.3 | 10.3
0.4 | 28.3	0.2 | 30.7	0.5 | 33	0.9 | 20.3	0.2 | 15.9	0.4 | 13.8
Al₂Br₆ (129)	0.3 | 30.8	0.8 | 34	C₅H₁₁NO (153) Valeramide	0.3 | 15.6	
0.05 | 30.9	0.5 | 31	C₃H₇NO (153) Propionamide	0.2 | 25.9	0.5 | 14.8	C₈H₇NO (139) Phthalimidine
0.1 | 31.0	SbCl₃ (210)	0.2 | 24.5	0.3 | 25.2	C₆H₁₆CIN (225) Triethylammonium chloride	0.1 | 30.8
0.2 | 31.2	0.3 | 29.2	0.3 | 23.9	0.4 | 24.5	0.2 | 24.5	C₈H₉NO (201) Acetanilide
Al₂I₆ (129)	0.4 | 28.4	0.4 | 22.8	C₅H₁₄CIN (225) Amylammonium chloride	0.3 | 24.3	0.1 | 28.3
0.05 | 31.3	0.5 | 27.7	C₃H₁₀CIN (210) <i>n</i> -Propylammonium chloride	0.2 | 9.4	0.4 | 24	0.2 | 24.8
0.1 | 31.1	SbCl₅ (159)	0.1 | 7	0.3 | 8.5	C₆H₁₆IN (210) Triethylammonium iodide	0.5 | 21.7
0.15 | 30.9	0.05 | 46.8	0.15 | 6	C₆H₃N₃O₇ (136) Picric acid	0.1 | 18	C₈H₉NO (153) Phenylacetamide
Al₂Br₆.2C₆H₅ClO₂S (129)	0.1 | 40.2	C₄H₄N₂ (222) Succinonitrile	0.05 | 31.6	0.2 | 14.7	0.15 | 28.1
Aluminium bromide benzenesulfone chloride	0.15 | 35.7	0.1 | 28	0.1 | 31.0	0.3 | 12.1	0.2 | 28.1
0.05 | 31.2	SbBr₃ (210)	0.2 | 25	0.3 | 28.7	0.35 | 11.2	
0.1 | 31.2	0.2 | 30.0	0.3 | 23	C₆H₁₀O₅ (221) Dimethyl malate	C₇H₆O₂ Benzoic acid (18, 139, 231)	C₈H₉NO₂ (153) Glycolanilide
Al₂Br₆.2C₆H₅NO₂ (129)	0.3 | 28.7	0.5 | 19	0.2 | 29.3	0.1 | 19	0.2 | 19.6
Aluminium bromide nitrobenzene	C₂HCl₃O₂ (243) Trichloroacetic acid	0.8 | 16	0.3 | 29.7	0.3 | 18	0.25 | 17.1
0.05 | 30.9	0.1 | 21.9	C₄H₉I (225) <i>tert</i> .-Butyl iodide	0.5 | 30.3	0.5 | 18	
0.1 | 30.9	0.15 | 20.5	0.1 | 24.8	0.7 | 30.9	C₇H₆O₃ (18) Salicylic acid	C₈H₁₀O (171) <i>p</i> -Methoxymethyl- benzene
AlC₁₅H₂₁O₆ (129) Acetylacetone	C₂H₂Cl₃NO (152) Trichloroacetamide	0.2 | 24.4	1.0 | 31.8	0.1 | 19.6	0.1 | 34.7
0.1 | 31.1	0.25 | 26.3	0.3 | 24.1	C₆H₁₀O₆ (221) Dimethyl tartrate	0.2 | 18.3	0.15 | 34.6
0.15 | 31.1	0.3 | 25.9	0.4 | 23.7	0.2 | 22.3	0.3 | 17.7	
AlC₁₈H₂₇O₉ (129) Ethyl acetoacetate	0.4 | 25.0	C₄H₉NO (153) <i>n</i> -Butyramide	0.3 | 23.1	C₇H₇NO (152) Benzamide	C₈H₁₁N (93) Dimethylaniline
0.1 | 31.3	C₂H₃Cl₂NO (152) Dichloroacetamide	0.3 | 26.8	0.4 | 23.3	0.25 | 25.9	0.1 | 31.9
0.15 | 31.3	0.25 | 25.5	0.4 | 25.9	0.5 | 22.9	0.3 | 25.5	C₈H₁₂BrN (225) Dimethylaniline hy- drobromide
ScC₁₅H₂₁O₆ (59) Acetylacetone	0.35 | 24.0	C₄H₉NO (153) Isobutyramide	C₆H₁₃NO (153) Isobutylacetamide	0.35 | 24.8	0.1 | 11.2
0.1 | 30.7	C₂H₃BrO₂ (225) Bromoacetic acid	0.2 | 27.7	0.1 | 27.2	C₇H₇NO (153) Formanilide	0.2 | 12.4
0.15 | 30.0	0.1 | 30.9	0.3 | 26.7	0.2 | 25.4	0.2 | 26	0.3 | 13.3
PrC₁₅H₂₁O₆ (58) Acetylacetone	0.2 | 27.0	0.4 | 25.6	0.3 | 23.8	0.3 | 25	0.45 | 13.0
0.1 | 30.7	0.3 | 24.8				
0.15 | 30.0	0.4 | 23.4				
PrC₁₅H₂₁O₆ (58) Acetylacetone	0.5 | 22.5				
0.1 | 30.7	C₂H₄ClNO (152) Chloroacetamide				
0.15 | 30.0	0.1 | 27.3				
BeC₁₀H₁₄O₄ (59) Acetylacetone	0.2 | 25.8				
	C₂H₅NO (152) Acetamide				

CHCl ₃ .—(Cont'd)			C ₉ H ₈ BrN.—(Cont'd)			C ₁₀ H ₁₃ NO.—(Cont'd)			C ₁₂ H ₂₈ IN (210)			C ₁₈ H ₃₁ N ₄ O ₇ (225)			C ₅₁ H ₉₈ O ₆ (222)		
C ₈ H ₁₂ CIN (210)			N			N			Tetrapropyl-			Tetrapropyl-			Tripalmitin		
Ethylaniline			Δt_B			Δt_B			ammonium iodide			ammonium picrate			N		
hydrochloride			x_1			x_1			N			Δt_B			x_1		
N			0.3			0.15			0.1			0.05			0.03		
0.15			12.8			39.8			0.3			12			33		
0.2			11.9			35.7			0.4			11.7			33		
0.3			11.1			C ₁₀ H ₁₆ CIN (210)			0.15			11.5			34.7		
C ₈ H ₁₂ IN (210)			C ₉ H ₈ CIN (210)			Diethylaniline			C ₁₂ H ₂₈ N ₂ O ₃ (225)			C ₁₉ H ₁₃ N (95)			C ₅₇ H ₁₁₀ O ₆ (222)		
Ethylaniline			Quinoline hydro-			hydrochloride			Tetrapropyl-			Phenylacridine			Tristearin		
hydroiodide			chloride			0.2			ammonium nitrate			0.1			0.04		
0.15			0.2			24.0			0.1			33.3			30.4		
0.2			15.8			0.3			0.2			0.15			30.6		
0.3			14.4			22.9			0.3			11.3			30.8		
C ₈ H ₁₂ O ₆ (221)			0.5			21.8			C ₁₃ H ₁₁ NO (152)			C ₁₉ H ₁₄ CIN (95)			0.07		
Dimethyl acetyl-			0.7			C ₁₀ H ₁₆ IN (210)			Benzanilide			Phenylacridinium			ThC ₂₀ H ₂₈ O ₈ (58)		
malate			0.03			Diethylaniline			0.2			chloride			Acetylacetate		
0.1			28.3			hydroiodide			0.4			0.02			0.05		
0.2			21.2			0.2			0.25			0.04			34.2		
0.3			C ₉ H ₁₀ O ₂ (18)			0.3			C ₁₃ H ₁₁ N ₃ O ₉			C ₁₉ H ₁₄ IN (95)			0.1		
0.5			Ethyl benzoate			0.4			Dimethylpyrone			Phenylacridinium			0.15		
0.7			0.2			(31, 39, 43, 75)			picrate			iodide			FeCl ₃ (264)		
0.9			0.5			0.05			(225, 228)			0.03			0.036		
C ₈ H ₁₃ CIN ₂ (210)			0.8			0.1			0.05			0.06			32.4		
Ethylphenylhydra-			C ₉ H ₁₁ NO (83)			0.15			0.1			C ₁₉ H ₁₆ (31)			NiC ₃₆ H ₆₆ O ₆ (225)		
zine hydrochloride			o-Acetotoluide			0.2			0.15			Triphenylmethane			Ricinoleate		
0.2			0.1			C ₁₀ H ₂₄ CIN (225)			0.1			0.04			0.15		
0.3			30.7			Diisoamylammo-			C ₁₃ H ₁₃ NO ₃			0.06			0.2		
0.4			C ₉ H ₁₁ NO (209)			nium chloride			Aniline salicylate			0.08			0.25		
0.5			0.1			0.1			(225, 228)			C ₂₀ H ₁₆ BrN (95)			CH ₂ Cl ₂		
C ₈ H ₁₄ O ₅ (221)			0.2			0.2			0.05			N-Methylphenyl-			Dichloromethane		
Diethyl malate			0.3			0.3			0.1			acridinium bromide			T _B = 313.1		
0.2			34			C ₁₁ H ₁₂ IN (210)			0.15			0.07			k _B = 31		
0.3			34			Quinoline ethiodide			C ₁₄ H ₁₀ (209)			C ₂₀ H ₁₆ CIN (95)			C ₂ H ₃ BrO ₂ (227)		
0.4			C ₉ H ₁₁ NO ₂ (153)			C ₁₁ H ₁₄ N ₄ O ₇ (225)			Anthracene			N-Methylphenyl-			Bromoacetic acid		
0.5			Lactanilide			Piperidine picrate			0.1			acridinium chloride			0.2		
C ₈ H ₁₄ O ₆ (221)			0.15			0.02			0.15			0.03			18.3		
Diethyl tartrate			0.2			C ₁₂ H ₁₀ (201)			0.15			0.05			18.1		
0.1			24.8			Acenaphthene			0.2			0.08			17.6		
0.2			22.8			0.1			0.25			C ₂₀ H ₁₆ IN (95)			0.8		
0.3			C ₉ H ₁₁ NO ₂ (153)			0.15			C ₁₄ H ₁₀ O ₂ (31)			N-Methylphenyl-			1.0		
0.4			Phenylurethane			0.2			Benzil			acridinium iodide			C ₄ H ₁₂ BrN (227)		
0.5			0.2			0.25			0.05			0.05			Diethylammonium		
C ₈ H ₁₂ CINO ₂ (225)			0.25			C ₁₂ H ₁₀ (209)			0.1			0.1			bromide		
p-Toluidine chloro-			33.5			Diphenyl			0.15			0.25			0.1		
acetate			73.6			0.1			0.2			C ₂₀ H ₂₄ O ₂ (171)			10.7		
0.05			61.6			0.15			0.3			Isoanethole			0.2		
0.1			41.6			0.2			C ₁₄ H ₁₄ OS (225)			0.01			9.3		
0.2			33.5			C ₁₂ H ₁₀ N ₂ (125)			Dibenzyl sulfoxide			0.02			8.0		
0.25			C ₉ H ₂₁ N (225)			Azobenzene			0.1			0.03			C ₄ H ₁₂ CIN (227)		
C ₉ H ₂₁ N (225)			0.2			0.05			0.2			0.05			Diethylammonium		
Tripropylamine			0.5			C ₁₂ H ₁₁ N (139, 209)			0.3			C ₂₀ H ₄₄ IN (210)			chloride		
0.2			28.9			Diphenylamine			0.25			Tetraisoamyl-			0.1		
0.5			31.8			0.1			0.1			ammonium iodide			13.1		
0.7			32.7			0.2			0.25			0.1			0.2		
C ₁₀ H ₈ (31, 201, 225)			32.7			C ₁₂ H ₂₈ BrN (210)			0.2			0.15			11.6		
Naphthalene			32.8			Tetrapropyl-			0.3			0.15			11.3		
0.05			32.8			ammonium bromide			0.2			C ₂₁ H ₂₂ CIN (210)			C ₄ H ₁₂ N ₂ O ₃ (227)		
0.1			C ₁₀ H ₉ N (142)			0.2			0.3			Tribenzyl-			Diethylammonium		
0.2			α-Naphthylamine			0.3			0.4			ammonium chloride			nitrate		
0.3			0.05			0.05			C ₁₂ H ₂₈ CIN (210)			0.1			0.15		
C ₈ H ₂₀ CIN (225)			32			Tetrapropyl-			C ₁₆ H ₁₁ N ₃ O ₇ (136)			0.15			8.1		
Tetraethylam-			Metanethole (liq.)			ammonium chloride			Naphthalene			0.1			7.2		
monium chloride			0.02			0.2			picrate			0.15			6.7		
0.1			26.8			0.3			0.05			0.15			6.5		
0.2			27.3			0.4			0.1			C ₂₁ H ₃₆ N ₄ O ₇ (225)			0.5		
0.3			27.5			0.5			0.1			Triisoamyl-			6.3		
0.4			27.9			0.1			0.1			ammonium picrate			C ₆ H ₃ N ₃ O ₇ (227)		
C ₈ H ₂₀ N ₂ O ₃ (225)			0.12			0.2			Allylbenzylmethyl-			0.05			Picric acid		
Tetraethylam-			28.1			0.3			phenylammonium			0.05			0.1		
monium nitrate			C ₁₀ H ₁₃ NO (153)			0.4			iodide			0.1			27.3		
0.2			Ethylacetanilide			0.5			0.1			0.13			26.3		
0.3			0.02			0.05			0.2			31			25.9		
0.4			26.8			0.05			0.3								
C ₉ H ₈ BrN (210)			27.3			0.07			0.4								
Quinoline hydro-			27.5			0.1			0.5								
bromide			27.9			0.12			0.1								

BOILING-POINT ELEVATIONS

C₆H₁₆BrN (227)Triethylammonium
bromide

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	22.5
0.2	23.1

C₆H₁₆CIN (227)Triethylammonium
chloride

0.1	27.7
0.2	26.2
0.3	25.7
0.4	25.4

C₆H₁₆N₂O₃ (227)Triethylammonium
nitrate

0.1	22.1
0.2	21.1
0.3	20.2
0.4	19.5
0.5	19.1

C₇H₆O₃ (227)

Salicylic acid

0.1	25.3
0.2	18.2
0.25	15.8

C₇H₈O₂ (227)

Dimethylpyrone

0.2	30.6
0.3	31.3

C₇H₉N (227)*p*-Toluidine

0.1	30.5
0.2	31.4

C₈H₂₀BrN (227)Tetraethylammonium
bromide

0.15	13.9
0.2	12.6
0.3	11.5
0.35	11.3

C₈H₂₀CIN (227)Tetraethylammonium
chloride

0.05	17.7
0.1	15.5
0.2	14.0
0.3	13.5
0.4	13.3

C₈H₂₀N₂O₃ (227)Tetraethylammonium
nitrate

0.2	9.6
0.3	10.1
0.4	10.4
0.45	10.6

C₉H₁₂ClNO₂ (227)*p*-Toluidine chloro-
acetate

0.05	49.2
0.1	38.0
0.2	26.8

C₁₀H₈ (227)

Naphthalene

C₁₀H₈—(Cont'd)*N*

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	33.3
0.1	32.5
0.2	31.0
0.25	30.2

C₁₁H₂₆IN (227)Ethyltripropyl-
ammonium iodide

1.0	15.7
1.5	16.5
2.0	17.0

C₁₂H₂₈IN (227)Tetrapropylammonium
iodide

0.1	12.3
0.2	14.7
0.3	16.0
0.4	17.1

C₁₂H₂₈N₂O₃ (227)Tetrapropylammonium
nitrate

0.05	25.8
0.1	21.9
0.15	20.7

C₁₃H₁₁N₃O₉ (227, 228)Dimethylpyrone
picrate

0.025	52.8
0.05	49.4
0.1	43.3
0.15	37.2

C₁₄H₁₅NO₃ (227, 228)*p*-Toluidine sali-
cylate

0.05	50.2
0.1	46.5
0.15	43.8

C₂₀H₄₄IN (227)Tetraamylammonium
iodide

0.05	14.0
0.1	17.1
0.2	19.4
0.25	20.5

C₂₁H₃₆N₄O₇ (227)Triamylammonium
picrate

0.05	29.3
0.1	28.8
0.2	28.7

CH₂O₂

Formic acid*

T_B = 373.6*k_B* = 53.0**C₆H₃N₃O₆ (66)**1, 3, 5-Trinitro-
benzene**C₇H₅N₃O₇ (66)**2, 4, 6-Trinitro-
anisole**C₇H₆O₂ (66)**

Benzoic acid

* Not anhydrous.

C₉H₈O₂ (29)

Cinnamic acid

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	51.6
0.2	50.0
0.3	48.4
0.4	46.5

C₉H₉N₃O₆ (66)

Trinitromesitylene

C₉H₁₀N₂O₄ (66)

Dinitromesitylene

C₁₀H₈O (66) β -Naphthol**C₁₃H₁₁NO (29)**

Benzanilide

0.1	52.0
0.2	50.5
0.3	49.1
0.4	47.6

C₁₄H₁₀O₂ (29)

Benzil

0.1	49.7
0.2	47.8
0.3	46.0
0.4	44.1
0.5	42.2

NaCHO₂ (29)

Formate

0.3	92.0
0.4	93.4
0.5	94.9
0.6	96.4

K₂SO₄ (29)

Formate

0.15	149.8
0.2	147.7
0.3	143.4
0.35	141.1

KCHO₂ (29)

Formate

0.2	95.4
0.3	96.7
0.4	98.1
0.5	99.5
0.6	100.8

CH₃I

Methyl iodide

T_B = 315.7*k_B* = 29.6**C₄H₇Cl₃O₂ (65)**

Chloral alcoholate

0.1	23.2
0.2	24.2
0.3	25.2

C₆H₄Br₂* (65)

Dibromobenzene

0.05	28.8
0.1	30.5
0.15	32.2

C₇H₆O₂ (34)

Benzoic acid

0.1	16.2
0.2	15.8
0.3	15.5

* The isomer used is
not given.**C₁₀H₁₆O (34)**

Camphor

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	29.6
0.2	30.2
0.3	30.7
0.5	31.9
0.6	32.5

C₁₂H₁₁N (34)

Diphenylamine

0.1	29.7
0.2	29.9
0.3	30.2
0.5	30.5

C₁₄H₁₀O₂ (34)

Benzil

0.1	29.0
0.2	29.1
0.3	29.2
0.4	29.3

CH₃NO₂

Nitromethane

T_B = 375*k_B* = 33.7**C₂H₅NO (220)**

Acetamide

0.1	30.0
0.2	29.6
0.3	29.3
0.4	28.9
0.5	28.5

C₆H₄N₂O₄ (220)*m*-Dinitrobenzene

0.1	33.0
0.2	33.0
0.3	33.1
0.4	33.1

C₈H₇N (220)

Benzyl cyanide

0.1	30.5
0.2	30.9
0.3	31.3

C₈H₂₀IN (220)Tetraethyl-
ammonium iodide

0.05	53
0.1	51
0.15	49
0.2	48

C₁₂H₁₁N (220)

Diphenylamine

0.1	33.7
0.2	33.7
0.3	33.7
0.4	33.7

C₁₄H₁₀O₂ (220)

Benzil

0.1	30.6
0.2	31.5

C₁₉H₁₆ (220)

Triphenylmethane

0.1	32.8
0.2	33

CH₄

Methane

T_B = 111.7*k_B* = 17**C₂H₄ (104)**

Ethylene

<i>N</i>	$\frac{\Delta t_B}{x_1}$
1.0	16
4.0	13
6.0	12

C₂H₆ (104)

Ethane

5.0	18
10.0	15

CH₄O

Methyl alcohol

T_B = 337.6*k_B* = 26.8**I₂ (49)**

0.2	25.7
0.5	24.3

NH₄ClO (124)

Hydroxylamine

hydrochloride

0.5	36
1.0	36
1.5	37

NH₄Br (113)

0.2	39.1
0.3	39.1

NH₄I (113)

0.1	40.0
0.2	38.6

NH₄NO₃ (124)

0.1	31
0.2	32

NH₄CNS (124)

0.1	36
0.2	36

NH₄NO₃ (124)

0.5	38
1.0	41

NH₄NO₃ (124)

1.5	43
-----	----

CH₄N₂O (265, 267)

Urea

0.5	24.9
1.0	23.9
2.0	22.9
3.0	22.0
4.0	21.3
5.0	20.6

C₂H₅NO (113, 267)

Acetamide

0.5	26.0
1.0	26.1
2.0	26.3
3.0	26.5
4.0	26.7
4.5	26.8

C₃H₇NO₂ (201, 267)

Urethane

0.2	26.7
0.5	26.6
1.0	26.5

C₃H₇NO₂—(Cont'd)*N*

<i>N</i>	$\frac{\Delta t_B}{x_1}$
1.5	26.4
2.0	26.3
3.0	25.7
3.5	25.7

CH₄O.—(Cont'd)**C₈H₇N₃O₆ (67)**Trinitro-*p*-xylene
C₈H₉NO (113, 267)

Acetanilide

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.5	25.6
1.0	25.2
2.0	24.3

C₈H₁₂O₆ (221)

Dimethyl acetylmalate

0.2	19.4
0.5	22.1
1.0	22.7

C₈H₁₄O₆ (221)

Diethyl malate

0.1	23.8
0.3	24.5
0.5	25.2
0.8	26.2

C₈H₁₄O₆ (221)

Diethyl tartrate

0.3	24.2
0.5	25.1
0.8	26.5

C₈H₂₀IN (220)

Tetraethylammonium iodide

0.1	36.6
0.2	34.7
0.3	32.9

C₉H₁₀N₂O₄ (67)Dinitromesitylene
C₁₀H₈ (201, 265, 267)

Naphthalene

0.1	26.2
0.3	24.9
0.5	23.8
0.8	22.2
1.0	21.4
2.0	19.5
3.0	17.6
4.0	15.7

C₁₀H₁₅BrO* (267)

Bromocamphor

0.5	24.8
1.0	23.4

C₁₀H₁₆O (267)

Camphor

0.5	25.4
1.0	24.4

C₁₁H₁₆O₃ (64)

Camphocarboxylic acid

0.2	27.1
0.5	27.0
0.6	26.9

C₁₂H₁₀ (201)

Acenaphthene

0.1	24.8
0.2	24.5
0.5	23.7
0.6	23.5

* The isomer used is not given.

C₁₂H₁₁N (113)

Diphenylamine

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.2	26.4

C₁₂H₁₃NO₃S (124)

Aniline benzene-sulfonate

0.1	29
0.2	30
0.3	30
0.4	31

C₁₄H₁₀O₂ (125, 267)

Benzil

0.2	23.3
0.5	22.2
1.0	20.3
1.5	18.4

C₁₉H₁₆ (113)

Triphenylmethane

0.1	26.3
0.2	25.1

HgCl₂ (189)

0.05	40.0
0.1	35.8
0.2	31.6
0.4	30.5
0.8	31.7

CuCl₂ (189)

0.1	35
0.2	35
0.3	34

MnCl₂ (189)

0.1	42
0.3	43
0.5	43
1.0	44

CoCl₂ (189)

0.1	40.6
0.2	36.2
0.3	31.7

NiCl₂ (189)

0.1	53
0.2	47
0.3	41
0.5	42
0.8	45

NiSO₄·6H₂O (251)**NiSO₄·7H₂O (251)****CrCl₃·6H₂O (green) (177, 248)****CrCl₃·6H₂O (violet) (248)****MoO(OH)₂Cl₂ (215)**

0.3	55
0.5	55
0.8	56

CaCl₂ (124)

0.2	26
0.5	32
1.0	41
1.5	51

Ca(NO₃)₂ (239)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	36.9
0.2	35.2
0.3	33.8
0.5	32.3
0.8	32.3
1.0	32.9
1.1	33.5

BaBr₂ (124)

0.1	48
0.2	51
0.3	53

LiCl (118, 239)

0.1	41.7
0.2	41.0
0.3	41.4
0.5	42.8
0.8	45.2
1.0	47.2
1.5	53.0
1.7	55.5

LiBr (118)

0.1	43.5
0.2	42.2
0.3	42.0
0.5	43.0
0.8	46.3
1.0	49.2
1.2	52.4

LiNO₃ (118)

0.1	36.8
0.2	37.8
0.5	40.6
0.8	43.3
1.0	45.2

NaBr (113, 124)

0.1	40.0
0.2	41.5
0.5	46.4
0.7	50

NaI (239)

0.1	47.1
0.2	44.5
0.3	43.6
0.5	44.3
0.8	47.0
1.0	49.2
1.5	55.5
1.8	59.7

NaCH₃O (269)

Methylate

NaC₂H₃O₂ (239)

Acetate	
0.1	39
0.2	36
0.3	34.2
0.5	34.5
0.8	35.4
1.0	35.7
1.5	35.5

KBr (113)

0.1	39.3
-----	------

KI (239)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	42
0.2	40
0.3	39.8
0.5	40.0
0.8	41.5

KC₂H₃O₂ (113, 239)

Acetate

0.1	37.2
0.2	35.3
0.3	34.7
0.5	35.2
0.8	37.1
1.0	37.8
1.5	39.2
1.7	39.5

C₂H₂Cl₂

1, 2-Dichloroethylene*

 $T_B = 328.6$ $k_B = 30.7$ **C₁₀H₈ (157)**

Naphthalene

0.4	31.7
0.6	32.2

C₁₃H₁₀O (157)

Benzophenone

0.4	32.0
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C₁₈H₁₆O₃ (157) γ -Ketopropionyl-dibenzoylmethane

0.1	27.9
0.2	28.2
0.3	28.3

* A mixture of the *cis* and *trans* forms.**C₂H₃Cl₃O₂**

Chloral hydrate

 $T_B = 371^*$ $k_B = 14.5$ **C₆H₄Br₂† (65)**

Dibromobenzene

0.1	14
0.2	12.6

C₆H₆O₂ (47)

Hydroquinol

0.1	11.8
0.2	12.3
0.3	12.9

C₆H₁₂O₆ (47)*d*-Glucose

0.1	14
-----	----

C₁₀H₈ (47, 65)

Naphthalene

0.1	14.5
0.2	14.3
0.3	13.9
0.4	13.1

C₁₀H₁₄O (47)

Thymol

0.1	16.1
0.2	16.0
0.3	15.9

* With dissociation.

† The isomer used is not given.

C₂H₃N

Acetonitrile

 $T_B = 355$ $k_B = 30$ **C₂H₅NO (220)**

Acetamide

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	35.0
0.25	33.8
0.35	33.4
0.45	33.1

C₄H₅NO₂ (220)

Methyl cyanoacetate

0.2	32.2
0.3	31.7

C₄H₁₂CIN (214)

Diethylammonium chloride

0.85	17.3
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C₄H₁₂CIN (214)

Isobutylammonium chloride

0.05	65.0
0.1	59.7
0.2	53.4

C₆H₃Cl₃ (67)

1, 3, 5-Trichlorobenzene

0.2	41.5
0.3	41.9

C₆H₃N₃O₇ (67)

Picric acid

0.1	49.6
0.15	46.4

C₆H₁₀O₆ (221)

Dimethyl tartrate

0.1	27.2
0.4	29.0
0.6	30.2

C₇H₅N (220)

Benzonitrile

0.5	31.5
0.7	32.0

C₇H₅N₃O₆ (67)

2, 4, 6-Trinitrotoluene

0.1	56.1
0.2	53

C₇H₈O₂ (220)

Dimethylpyrone

0.1	31.2
0.2	32.4
0.3	33.5
0.4	34.0
0.6	33.9

C₈H₇N (220)

Benzyl cyanide

0.15	29.8
0.25	31.1
0.35	31.5
0.45	32.0

C₈H₇N₃O₆ (67)Trinitro-*p*-xylene

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.04	60.0
0.09	58.5

C₈H₂₀IN (220)

Tetraethylammonium iodide

0.1	46
0.2	46

C₉H₉BrN₂O₄ (67)

Bromodinitromesitylene

0.1	42.1
0.15	42.7

C₉H₁₀N₂O₄ (67)

Dinitromesitylene

C₁₀H₈ (123)

Naphthalene

0.2	31.4
0.5	31.9
0.7	32.2

$C_6H_{10}O_6$ (220)	
Dimethyl tartrate	
N	$\frac{\Delta t_B}{x_1}$
0.05	33
0.1	32.7
0.2	32.9
0.25	33.0
$C_{12}H_{11}N$ (220)	
Diphenylamine	
0.1	36.4
0.2	36.7
0.3	36.9
0.4	37.1
$C_{14}H_{10}$ (220)	
Phenanthrene	
0.1	35.9
0.2	36.8
0.3	37.7
$C_{14}H_{10}O_2$ (220)	
Benzil	
0.05	36.2
0.1	36.3
0.15	36.4
$C_{19}H_{16}$ (220)	
Triphenylmethane	
0.05	35.8
0.1	35.3
0.15	34.6

$C_2H_4Br_2$	
1, 2-Dibromoethane	
$T_B = 404.8$	
$k_B = 34.3$	
$C_8H_8O_3$ (18)	
Phenoxyacetic acid	
0.1	28
0.2	26.4
0.3	26.0
$C_{10}H_{16}O$ (34)	
Camphor	
0.1	32.0
0.2	32.4
0.3	32.8
0.5	33.6
0.7	34.4
$C_{12}H_{10}NO$ (237)	
1-Benzoylpyridinium	
$C_{12}H_{11}N$ (34)	
Diphenylamine	
0.1	34
0.2	35.0
0.3	35.8
0.4	36.6
$C_{13}H_{10}O_2$ (34)	
Phenyl benzoate	
0.1	36.3
0.2	36.6
0.3	36.9
0.4	37.2
0.5	37.8
$C_{14}H_{10}$ (169)	
Anthracene	
0.01	33.3
0.02	34.0
0.03	34.3

$C_{14}H_{10}O_2$ (34)	
Benzil	
N	$\frac{\Delta t_B}{x_1}$
0.1	36.6
0.2	36.9
0.3	37.1
0.5	37.5
0.7	38.0
$C_{19}H_{16}$ (169)	
Triphenylmethane	
0.01	35
0.02	35
0.03	36
$C_{21}H_{23}NO_6^*$ (240)	
Colchicine	
0.02	35
0.03	35.6
0.04	36.0
$C_{22}H_{25}NO_6$ (240)	
Colchicine	
0.03	36
$C_{30}H_{20}O_2S_2$ (20)	
Desaurin	
0.03	33.5
$C_2H_4Cl_2$	
1, 1-Dichloroethane	
$T_B = 330.4$	
$k_B = 31.3$	
$C_2HBr_3O_2^*$ (270)	
Tribromoacetic acid	
$C_5H_{10}O_2^*$ (270)	
Isovaleric acid	
$C_7H_6O_2$ (34)	
Benzoic acid	
0.1	18.4
0.3	17.7
0.5	17.4
0.9	17.2
1.1	17.0
$C_8H_{20}BrN^*$ (270)	
Tetraethylammonium bromide	
$C_{10}H_{16}O$ (34)	
Camphor	
0.2	31.9
0.4	32.7
0.6	33.4
0.8	34.1
1.0	34.8
$C_{12}H_{11}N$ (34)	
Diphenylamine	
0.1	31.1
0.3	30.9
0.5	30.8
0.7	30.8
$C_{12}H_{28}IN^*$ (270)	
Tetrapropylammonium iodide	
$C_{14}H_{10}O_2$ (34)	
Benzil	
0.1	31.9
0.2	33.2
0.5	37.0

* Associated.

$C_2H_4Cl_2$	
1, 2-Dichloroethane	
$T_B = 356.8$	
$k_B = 31.5$	
I_2 (49)	
N	$\frac{\Delta t_B}{x_1}$
0.1	42
0.2	42
$C_7H_6O_2$ (34)	
Benzoic acid	
0.2	21.4
0.5	20.2
0.7	19.8
$C_8H_8O_3$ (34)	
Anisic acid	
0.2	19.0
0.3	18.9
C_8H_9NO (34)	
Acetanilide	
0.1	31.2
0.2	29.6
0.3	28.2
0.5	25.7
0.8	23.5
$C_{10}H_{16}O$ (34)	
Camphor	
0.1	33.2
0.2	33.5
0.5	34.3
0.7	35.0
1.0	35.8
1.2	36.4
$C_{12}H_{11}N$ (34)	
Diphenylamine	
0.1	30.8
0.2	31.4
0.5	32.9
0.8	33.7
$C_{14}H_{10}O_2$ (34)	
Benzil	
0.1	33.3
0.2	33.4
0.3	33.5
0.4	33.7

C_2H_4O	
Acetaldehyde	
$T_B = 293.3$	
$k_B = 27$	
C_2H_7NO (5)	
Acetaldehyde ammonia	
0.15	45.6
0.3	49.8
0.4	52.1
0.55	53.6
$C_{10}H_{18}O$ (5)	
l-Borneol	
0.005	26.1
0.01	26.0
0.02	27.9
0.025	28.1
$C_{13}H_{10}O$ (5)	
Benzophenone	
0.15	27.7
0.35	27.5

$C_2H_4O_2^*$	
Acetic acid	
$T_B = 391.2$	
$k_B = 51.8$	
$BiC_6H_5O_6$ (29)	
Acetate	
N	$\frac{\Delta t_B}{x_1}$
0.05	52
0.1	52
0.2	52
$C_6H_3N_3O_7$ (29)	
Picric acid	
0.1	51.8
0.2	51.0
0.25	50.4
$C_6H_5NO_3$ (156)	
p-Nitrophenol	
0.4	42.7
$C_6H_{16}BrN$ (214)	
Triethylammonium bromide	
$C_6H_{16}IN$ (214)	
Triethylammonium iodide	
$C_7H_5BrO_2$ (29)	
p-Bromobenzoic acid	
0.1	47.1
0.3	46.1
0.5	45.4
$C_7H_6O_2$ (18)	
Benzoic acid	
0.06	40.4
0.15	42.9
0.25	43.0
0.45	43.1
0.65	43.3
1.0	45.0
C_8H_9NO (29)	
Acetanilide	
0.1	53.3
0.2	53.1
0.3	52.2
$C_8H_{20}BrN$ (214)	
Tetraethylammonium bromide	
$C_{10}H_{10}N_2O_2$ (156)	
o-Phenylenesuccinamide	
0.1	42.3
$C_{12}H_{10}N_2$ (29)	
Azobenzene	
0.1	47.9
0.2	48.1
$C_{12}H_{11}N$ (33)	
Diphenylamine	
0.05	51.4
0.1	51.2
0.2	50.9
0.3	50.5
$C_{13}H_{11}NO$ (29)	
Benzanilide	
0.05	50.7
0.1	49.2
0.15	48.4
0.2	47.9

$C_{14}H_{10}^{\dagger}$ (18)	
Anthracene	
N	$\frac{\Delta t_B}{x_1}$
0.05	42.3
0.1	43.1
0.2	44.3
$C_{14}H_{10}O_2$ (29, 97)	
Benzil	
0.1	51.4
0.15	50.6
0.25	49.8
$C_{14}H_{12}O_2$ (29)	
Benzoin	
0.05	50
0.1	51
0.2	51
0.25	51
$C_{19}H_{21}NO_5$ (240)	
Trimethylcolchicine acid	
0.02	33.6
0.05	33.8
0.09	34.1
$C_{20}H_{12}O_3$ (156)	
Fluoran	
0.15	42.4
0.2	42.7
$C_{21}H_{23}NO_6$ (240)	
Colchicine	
0.02	51.4
0.03	52.5
0.05	53.1
0.07	53.3
$C_{22}H_{25}NO_6$ (240)	
Colchicine	
0.01	47.0
0.03	45.6
0.05	44.0
$PbC_4H_6O_4$ (29)	
Acetate	
0.05	55
0.1	54
0.2	52
$PbC_8H_{12}O_8$ (247)	
Tetraacetate	
0.05	54
0.1	53
0.2	53
$Cu_9H_{21}ClN_3O_3S_3$	
Cuprous trianthamidechloride (257)	
0.02	149
0.05	136
0.08	132
$CaC_4H_6O_4$ (29)	
Acetate	
0.04	46.5
0.1	42.2
0.15	39.4
$SrC_4H_6O_4$ (29)	
Acetate	
0.05	51.3
0.1	48.0
0.2	42.3

$BaC_4H_6O_4$ (29)	
Acetate	
N	$\frac{\Delta t_B}{x_1}$
0.04	48.7
0.1	49.9
0.15	50.5
0.2	50.5
0.25	50.9
$LiC_2H_3O_2$ (29)	
Acetate	
0.1	54
0.2	53
0.3	51.8
0.4	50.9
0.55	49.7
$NaC_2H_3O_2$ (18, 29)	
Acetate	
0.1	49.2
0.3	50.0
0.5	50.2
0.8	51.0
$KC_2H_3O_2$ (29)	
Acetate	
0.1	50.8
0.2	52.1
0.3	53.0
0.4	53.6
0.55	54.3

* Partially associated at T_B . \dagger Acid not anhydrous.

$C_2H_4O_2$	
Methyl formate	
$T_B = 304.9$	
$k_B = 25.1$	
$C_{14}H_{10}O_2$ (34)	
Benzil	
0.1	25.3
0.2	25.4
0.3	25.6

C_2H_5Br	
Ethyl bromide	
$T_B = 311.1$	
$k_B = 29.4$	
$C_4H_7Cl_3O_2$ (65)	
Chloral alcoholate	
0.1	28.5
0.2	28.6
0.3	28.7
$C_6H_4Br_2^*$ (65)	
Dibromobenzene	
0.1	32
0.18	34.6
$C_7H_6O_2$ (266)	
Benzoic acid	
0.1	15.3
0.5	16.0
1.0	16.9
C_8H_9NO (34)	
Acetanilide	
0.2	27
0.3	24
0.5	17

C₂H₅Br.—(Cont'd)

C ₁₀ H ₈ (267)	
Naphthalene	
N	$\frac{\Delta t_B}{x_1}$
0.2	28.4
0.5	29.0
0.7	29.5

C ₁₀ H ₁₅ BrO* (267)	
Bromocamphor	
N	$\frac{\Delta t_B}{x_1}$
0.1	28.6
0.3	29.5
0.5	30.3

C ₁₀ H ₁₆ O (34)	
Camphor	
N	$\frac{\Delta t_B}{x_1}$
0.1	30.8
0.3	31.6
0.5	32.4
0.7	33.2
0.9	34.0

C ₁₂ H ₁₁ N (34)	
Diphenylamine	
N	$\frac{\Delta t_B}{x_1}$
0.1	29.9
0.3	30.0
0.5	30.1
0.7	30.2

C ₁₄ H ₁₀ O ₂ (34)	
Benzil	
N	$\frac{\Delta t_B}{x_1}$
0.1	29.7
0.3	29.9
0.5	30.1

AlBr ₃ (249)	
N	$\frac{\Delta t_B}{x_1}$
0.48	25.1

* The isomer used is not given.

C ₂ H ₅ Cl	
Ethyl chloride	
$T_B = 285.3$	
$k_B = 30$	
I ₂ (40)	
N	$\frac{\Delta t_B}{x_1}$
0.05	29.6
0.1	30.8
0.15	32.0

SCl ₂ (40, 121)	
N	$\frac{\Delta t_B}{x_1}$
0.1	26.6
0.2	26.7
0.25	26.8

S ₂ Cl ₂ (40)	
N	$\frac{\Delta t_B}{x_1}$
0.1	32.0
0.3	31.6
0.5	31.2

C ₆ H ₄ Br ₂ (40)	
<i>p</i> -Dibromobenzene	
N	$\frac{\Delta t_B}{x_1}$
0.1	30.7
0.15	31.0
0.2	31.3

C ₆ H ₄ Cl ₂ (40)	
<i>p</i> -Dichlorobenzene	
N	$\frac{\Delta t_B}{x_1}$
0.1	29.0
0.2	29.5
0.25	29.7

C₁₀H₈ (40)

Naphthalene	
N	$\frac{\Delta t_B}{x_1}$
0.1	30.2
0.2	30.0
0.3	29.7

C ₁₂ H ₁₀ (40)	
Diphenyl	
N	$\frac{\Delta t_B}{x_1}$
0.1	32.0
0.2	32.1
0.25	32.1

C ₂ H ₅ I	
Ethyl iodide	
$T_B = 345.3$	
$k_B = 32.4$	
C ₈ H ₉ NO (34)	
Acetanilide	
N	$\frac{\Delta t_B}{x_1}$
0.1	25.5
0.2	18.9
0.3	18.1
0.4	17.7

C ₁₀ H ₁₆ O (34)	
Camphor	
N	$\frac{\Delta t_B}{x_1}$
0.1	33.0
0.2	33.3
0.4	33.9
0.6	34.5

C ₁₂ H ₁₁ N (34)	
Diphenylamine	
N	$\frac{\Delta t_B}{x_1}$
0.1	32.5
0.2	32.7
0.4	33.1
0.6	33.5

C ₁₄ H ₁₀ O ₂ (34)	
Benzil	
N	$\frac{\Delta t_B}{x_1}$
0.1	32.3
0.2	32.2
0.3	32.1
0.5	31.9

C ₂ H ₅ NO ₂	
Nitroethane	
$T_B = 387.9$	
$k_B = 37$	

C ₇ H ₆ O ₂ (34)	
Benzoic acid	
N	$\frac{\Delta t_B}{x_1}$
0.1	34.0
0.2	31.5
0.3	30.1

C ₁₄ H ₁₀ O ₂ (34)	
Benzil	
N	$\frac{\Delta t_B}{x_1}$
0.1	35.6
0.2	34.3

C ₂ H ₆ O	
Ethyl alcohol	
$T_B = 351.6$	
$k_B = 26$	

I ₂ (49)	
N	$\frac{\Delta t_B}{x_1}$
0.1	26.2
0.3	27.3
0.4	27.5
0.5	27.3

SeO₂ (178)

N	$\frac{\Delta t_B}{x_1}$
0.1	24.7
0.2	24.8
0.5	25.0
1.0	25.5
2.0	26.4
3.0	27.2
4.0	28.1
5.0	29.3
6.0	32.2

NH ₄ ClO (124)	
Hydroxylamine hydrochloride	
N	$\frac{\Delta t_B}{x_1}$
0.3	19.1
0.5	19.6
1.0	20.8
1.5	22.1

NH ₄ Br (113)	
N	$\frac{\Delta t_B}{x_1}$
0.15	30.5
0.2	30.4
0.25	30.4

NH ₄ I (116)	
N	$\frac{\Delta t_B}{x_1}$
0.05	35.1
0.1	33.7
0.15	32.2
0.2	33.0
0.3	34.9

NH ₄ NO ₃ (124)	
N	$\frac{\Delta t_B}{x_1}$
0.1	23.2
0.2	24.8
0.4	25.7
0.6	25.3

NH ₄ CNS (124)	
N	$\frac{\Delta t_B}{x_1}$
0.2	24.0
0.3	25.7
0.5	28.2
0.7	30.0
1.0	31.8
1.2	32.9
1.6	35.3

CH₄N₂O (152, 201)

Urea	
N	$\frac{\Delta t_B}{x_1}$
0.4	24.9
0.5	24.7
1.0	23.8
1.5	22.9

C ₂ H ₂ Cl ₃ NO (152)	
Trichloroacetamide	
N	$\frac{\Delta t_B}{x_1}$
0.4	27.3
0.5	27.4
0.6	27.5

C ₂ H ₃ Cl ₂ NO (152)	
Dichloroacetamide	
N	$\frac{\Delta t_B}{x_1}$
0.6	27.8
0.8	28.0
1.0	28.2

C ₂ H ₄ ClNO (152)	
Chloroacetamide	
N	$\frac{\Delta t_B}{x_1}$
0.7	25.9
1.0	25.9
1.1	25.9

C ₂ H ₅ NO (103, 152)	
Acetamide	

C₂H₅NO.—(Cont'd)

N	$\frac{\Delta t_B}{x_1}$
0.1	24.7
0.2	24.7
0.4	24.7
0.6	25.3
0.8	26.2
1.0	27.0
1.2	27.4

C ₂ H ₅ NO ₂ (153)	
Glycolamide	
N	$\frac{\Delta t_B}{x_1}$
0.4	24.6
0.5	24.7
0.7	24.9
0.9	25.1

C ₃ H ₄ Cl ₃ NO ₂ (152)	
Trichlorolactamide	
N	$\frac{\Delta t_B}{x_1}$
0.3	27.7
0.4	27.9
0.5	28.1
0.6	28.3

C ₃ H ₆ N ₂ O ₂ (152)	
Malonamide	
N	$\frac{\Delta t_B}{x_1}$
0.15	25.3
0.2	23.4
0.25	21.6

C ₃ H ₇ NO (153)	
Propionamide	
N	$\frac{\Delta t_B}{x_1}$
0.5	23.2
0.7	23.4
1.0	23.6
1.1	23.7

C ₃ H ₇ NO ₂ (153)	
Lactamide	
N	$\frac{\Delta t_B}{x_1}$
0.4	25.7
0.5	25.4
0.7	24.9

C ₃ H ₇ NO ₂ (153, 201)	
Urethane	
N	$\frac{\Delta t_B}{x_1}$
0.3	24.6
0.5	24.7
0.7	24.9
1.0	25.1
1.2	25.3

C ₄ H ₅ NO ₂ (201)	
Succinimide	
N	$\frac{\Delta t_B}{x_1}$
0.3	24.7
0.5	24.1
1.0	22.7
1.2	22.1

C ₄ H ₆ O ₄ (18)	
Succinic acid	
N	$\frac{\Delta t_B}{x_1}$
0.2	24.3
0.3	25.1
0.5	26.8

C ₄ H ₆ O ₆ (18)	
<i>d</i> -Tartaric acid	
N	$\frac{\Delta t_B}{x_1}$
0.1	24.4
0.2	24.6
0.5	25.4
1.0	26.7
1.4	27.2

C ₄ H ₆ O ₆ (18)	
<i>dl</i> -Tartaric acid	

C₄H₆O₆.—(Cont'd)

N	$\frac{\Delta t_B}{x_1}$
0.1	26.7
0.2	26.1
0.4	25.0

C ₄ H ₉ NO (153)	
<i>n</i> -Butyramide	
N	$\frac{\Delta t_B}{x_1}$
0.4	25.9
0.6	26.5
0.8	27.1

C ₄ H ₉ NO (153)	
Isobutyramide	
N	$\frac{\Delta t_B}{x_1}$
0.4	25.8
0.5	26.0
0.7	26.5
0.9	26.9

C ₄ H ₁₂ CIN (214)	
Diethylammonium chloride	

C ₄ H ₁₂ CIN (214)	
Isobutylammonium chloride	

C ₅ H ₁₁ NO (153)	
Isovaleramide	
N	$\frac{\Delta t_B}{x_1}$
0.4	26.8
0.5	27.4
0.7	28.1
1.0	28.4

C ₅ H ₁₂ CIN (200)	
Piperidinium chloride	

C ₅ H ₁₂ N ₂ O ₃ (200)	
Piperidinium nitrate	

C ₆ H ₂ CIN ₃ O ₆ (67)	
Picryl chloride	
N	$\frac{\Delta t_B}{x_1}$
0.1	26.2
0.2	24.8

C ₆ H ₃ N ₃ O ₇ (265)	
Picric acid	
N	$\frac{\Delta t_B}{x_1}$
0.1	25.0
0.5	23.1
1.0	20.7
1.2	19.8

C ₆ H ₄ N ₂ O ₄ (175)	
<i>m</i> -Dinitrobenzene	
N	$\frac{\Delta t_B}{x_1}$
0.3	24.3
0.5	22.8
0.7	21.3

C₇H₇NO (153)		C₈H₁₁N.—(Cont'd)		C₁₀H₁₃NO (153)		C₁₂H₂₈IN.—(Cont'd)		C₂₀H₁₆IN (94)		MoO(OH)₂Cl₂ (215)	
Formanilide		<i>N</i> $\frac{\Delta t_B}{x_1}$		Ethylacetanilide		<i>N</i> $\frac{\Delta t_B}{x_1}$		<i>N</i> -Methylphenyl- acridinium iodide		<i>N</i> $\frac{\Delta t_B}{x_1}$	
<i>N</i>		0.3	23.2	<i>N</i>		0.2	27.7			0.1	32.1
0.4	26.9	0.4	22.2	0.3	27.3	0.4	25.9			0.2	32.5
0.5	26.9	C₈H₁₂ClN (214)		0.5	27.1	0.6	25.3			0.5	33.5
0.9	26.9	Ethylphenyl- ammonium chloride		0.7	26.9	C₁₂H₂₈N₂O₃ (214)		<i>N</i> $\frac{\Delta t_B}{x_1}$		1.0	35.2
C₇H₇NO₂ (152)		C₈H₂₀BrN (214)		C₁₀H₁₆O (43, 75)		Tetrapropylam- monium nitrate		0.15	27.6	1.1	35.5
Salicylamide		Tetraethyl- ammonium bromide		Camphor		C₁₃H₁₀O (146)		Pinabietic acid		LaCl₃ (58)	
0.3	25.8	0.2	30.4	0.1	24.2	Benzophenone		0.05	26.8	0.1	24.6
0.4	26.1	0.4	28.3	0.2	24.2	0.5	27.6	0.1	25.5	0.2	23.4
0.5	26.4	0.5	27.9	0.3	24.2	0.6	26.6	C₂₁H₃₂O₂ (216)		0.3	22.1
C₇H₈N₂O (153)		0.6	28.5	0.5	24.2	0.7	25.5	Methyl pinabietate		CeCl₃ (162)	
Phenylurea		0.8	29.5	C₁₀H₁₈O (18)		C₁₃H₁₀O₂ (18)		0.05	25.8	0.05	30.3
0.5	22.9	C₈H₂₀ClN (214)		Borneol		Phenyl benzoate		0.1	25.7	0.2	30.2
0.7	22.6	Tetraethyl- ammonium chloride		0.1	24.5	0.2	23.2	TiC₅H₇O₂ (250.5)		PrCl₃ (242)	
1.0	22.1	C₈H₂₀IN (214, 220)		0.2	24.2	0.3	22.7	Acetylacetone		Pr(NO₃)₃ (140)	
C₇H₉N (201)		Tetraethyl- ammonium iodide		0.5	23.5	0.5	21.7	ZnC₁₀H₁₄O₄ (263.5)		0.1	25.6
<i>p</i> -Toluidine		0.1	28.3	0.7	23.1	C₁₃H₁₁NO (152)		Acetylacetone		0.2	25.6
0.1	26.0	0.3	26	1.0	22.3	Benzanilide		ZnCl₂ (56)		0.3	25.7
0.3	25.6	0.5	24	C₁₁H₁₂IN (214)		0.2	27.0	0.1	24.6	NdCl₃ (252)	
0.5	25.2	0.6	22	<i>N</i> -Ethylquino- linium iodide		0.3	27.5	0.2	26.2	0.1	26
0.7	24.9	C₉H₁₀O₂ (18)		0.1	33.2	C₁₃H₁₂N₂O (153)		0.3	27.5	0.4	27.6
0.9	24.5	Ethyl benzoate		0.2	26.6	Diphenylurea		CdI₂ (116, 135)		MgCl₂ (197)	
C₇H₁₂O₄ (269)		0.1	22.1	0.3	24.2	0.1	26.9	0.1	27.3	0.5	22
Diethyl malonate		0.4	20.9	0.5	21.4	C₁₄H₁₀ (201)		0.2	27.7	1.0	33.6
0.1	25.3	0.5	20.7	C₁₂H₁₀ (201)		Phenanthrene		0.3	28.1	1.5	45.0
0.2	24.2	0.7	20.4	Acenaphthene		0.1	25.2	0.5	28.8	1.7	49.5
0.3	23.0	1.0	20.0	0.2	24.8	0.2	24.5	1.0	30.8	MgC₁₀H₁₄O₄ (263.5)	
C₈H₄O₃ (231)		1.3	19.6	0.4	23.8	0.5	22.4	1.5	32.7	Acetylacetone	
Phthalic anhydride		C₉H₁₁NO (153)		0.6	22.8	0.8	20.3	1.8	33.2	CaCl₂	
0.5	24.2	Methylacetanilide		0.8	21.8	C₁₄H₁₀O₂ (18, 139, 175)		HgCl₂ (18, 188)		(124, 197, 239)	
1.0	24.9	0.4	26.5	1.0	20.8	Benzil		0.1	25.8	0.1	28
1.5	25.7	0.5	26.5	C₁₂H₁₀N₂ (146)		0.1	24.3	0.2	25.9	0.3	24
C₈H₉NO		0.8	26.6	Azobenzene		0.3	22.8	0.5	26.2	0.5	25.2
Acetanilide		1.0	26.6	C₁₂H₁₀O₂S (48)		0.5	21.4	1.0	26.3	1.0	28.4
(18, 103, 139, 152, 188, 200, 201)		C₉H₁₁NO₂ (153)		Phenylsulfone		0.6	20.7	HgI₂ (246)		1.5	31.6
0.1	26.1	Lactanilide		0.1	24.8	C₁₈H₃₄O₂ (138)		0.04	27.9	2.0	36.1
0.2	26.0	Phenylurethane		0.2	23.8	Oleic acid		CuCl₂ (145)		2.5	40.7
0.4	25.7	0.4	26.6	0.5	20.9	0.1	25	0.05	25.8	3.0	45.3
0.6	25.5	0.5	26.5	C₁₂H₁₁N (175)		0.5	25	0.1	25.7	Ca(NO₃)₂	
0.8	25.2	0.7	26.3	Diphenylamine		1.0	25	0.2	25.4	(113, 117, 118, 239)	
1.0	24.9	C₉H₁₁NO₂ (153)		0.6	23.0	1.8	25	0.25	25.3	0.06	29.0
C₈H₉NO (18)		Phenylurethane		0.8	23.6	C₁₉H₁₆ (31)		AgNO₃ (239)		0.1	27.4
Acetophenone oxime		0.4	26.4	C₁₂H₁₁N₃O₂ (233)		Triphenylmethane		0.06	38.5	0.2	25.7
0.1	26.1	0.5	26.3	<i>o</i> -Nitrobenzidine		0.1	28	0.1	35.6	0.3	24.9
0.2	25.3	0.7	25.9	0.1	26.4	0.2	27	0.15	32.6	0.5	24.3
0.3	24.6	C₁₀H₈ (201)		C₁₂H₁₂ClN₂OP		0.3	26	0.2	29.6	0.7	24.2
0.5	23.4	Naphthalene		Chlorophosphoxy- dianilide (163)		C₂₀H₁₃N₃O₇ (52)		FeCl₃ (24)		0.9	24.2
0.7	22.4	0.2	23.8	0.08	31.3	Phenanthrene picrate		0.1	20.9	LiCl (117, 118, 139, 197, 211)	
0.9	22.0	0.3	23.4	0.1	33.2	0.05	48.1	0.3	22.5	0.1	29.4
C₈H₉NO (153)		0.5	22.7	0.14	36.8	0.1	46.0	0.5	24.1	0.3	31.4
Phenylacetamide		0.7	21.9	C₁₂H₁₃NO₃S (124)		0.2	41.9	0.7	25.6	0.5	33.5
0.3	25.9	1.0	21.2	Aniline benzene- sulfonate		0.25	39.8	CoCl₂ (74)		1.0	38.7
0.5	26.4	1.1	21.0	0.1	22.2	C₂₀H₁₆BrN (94)		Co(CNS)₂ (96)		1.5	47.2
0.8	26.8	C₁₀H₁₀IN (205)		0.2	23.7	<i>N</i> -Methylphenyl- acridinium bromide		0.08	25.2	2.0	56.6
C₈H₉NO₂ (153)		<i>N</i> -Methylquino- linium iodide		0.3	24.3	0.15	25.8	0.27	25.4	4.5	69
Glycolanilide		0.33	25.3	0.4	24.6	C₂₀H₁₆ClN (94)		CrCl₃·6H₂O* (green)		LiBr (118)	
0.3	27.1	C₁₀H₁₀IN (94)		C₁₂H₂₈IN (214)		<i>N</i> -Methylphenyl- acridinium chloride		(177, 271)		0.1	27.7
0.4	26.5	<i>N</i> -Methylisoquino- linium iodide		Tetrapropylam- monium iodide		0.1	29.2	0.05	30.5	0.2	29.3
0.5	26.0	0.17	26.7					0.1	28.9	0.5	34.1
0.6	25.8							0.25	24.0	1.0	42.1
C₈H₁₁N (166)								Mo₃Cl₆ (253)		1.2	45.4
Dimethylaniline								0.02	23.9		
								0.04	24.6		

C₂H₆O.—(Cont'd)

LiI (211)	
N	$\frac{\Delta t_B}{x_1}$
0.5	35.6
0.8	35.7
LiNO ₃ (117, 118)	
0.1	28.1
0.2	28.7
0.5	30.7
1.0	34.1
1.5	37.4
1.7	38.8
NaClO ₄ (179)	
0.6	25.7
0.8	26.9
1.0	28.1
NaBr (113)	
0.05	32.1
0.1	31.0
0.2	28.9
0.3	26.8
NaI (113, 116, 135)	
0.1	33.3
0.3	32.2
0.5	33.4
1.0	38.4
1.5	44.3
NaC ₂ HCl ₂ O ₂ (200)	
Dichloroacetate	
NaC ₂ H ₃ O ₂ (113, 239)	
Acetate	
0.05	32.6
0.1	28.2
NaC ₂ H ₅ O (48)	
Ethylate	
0.2	29.6
0.5	31.6
0.7	33.0
1.0	35.0
NaC ₆ H ₉ O ₃ (48)	
Ethyl acetoacetate	
0.1	27.6
0.2	25.9
0.3	24.2
NaC ₇ H ₁₁ O ₄ (48)	
Diethylmalonate	
0.1	26.1
0.2	24.7
0.3	23.3
NaC ₁₂ H ₂₃ O ₂ (132)	
Laurate	
0.14	23.5
NaC ₁₄ H ₂₇ O ₂ (132)	
Myristate	
0.1	24.8
NaC ₁₆ H ₃₁ O ₂ (132)	
Palmitate	
0.07	24.7
NaC ₁₈ H ₃₃ O ₂ (174)	
Oleate	
0.05	31.0
0.1	28.6
0.15	27.2
0.2	25.8

KI (113, 116)

N	$\frac{\Delta t_B}{x_1}$
0.05	32.0
0.1	32.0
0.2	31.9
0.3	31.3
0.35	31.3
KCHO ₂ (132)	
Formate	
0.42	24.4
KC ₂ H ₃ O ₂ (18, 113, 239)	
Acetate	
0.1	29.8
0.3	26.9
0.5	26.2
0.7	25.8
1.0	25.3
1.1	25.1
KC ₂ H ₅ O (48)	
Ethylate	
0.1	28.2
0.2	29.0
0.5	31.4
0.6	32.2
KC ₇ H ₅ O ₃ (244)	
Salicylate	
0.15	26.8
0.25	26.9
KC ₇ H ₁₃ O ₂ (132)	
Heptylate	
0.4	25.0
0.5	25.1
0.7	25.2
1.0	25.4
KC ₁₄ H ₁₁ O ₆ (244)	
Hydrogen <i>p</i> -hydroxybenzoate	
0.1	47.9
0.2	46.1
0.25	45.3
KC ₁₈ H ₃₃ O ₂ (138)	
Oleate	
0.1	26.4
0.2	26.5
0.5	26.8
0.7	27.0
1.0	27.2
1.1	27.3

* Uncorrected for partial vapor pressure of solute.

C₂H₆S

Methyl sulfide
 $T_B = 309.3$
 $k_B = 30.4$

C₁₂H₁₁N (238)

Diphenylamine

0.05 30.4

0.1 30.4

0.3 30.4

0.5 30.4

ZnCl₂ (238)

0.1 32.1

0.2 31.9

0.3 31.8

ZnBr₂ (238)

N	$\frac{\Delta t_B}{x_1}$
0.1	30.9
0.2	32.2

ZnI₂ (238)

0.1	30.6
0.2	30.5

CdI₂ (238)

0.05	28.7
0.1	29.7
0.2	31.6

HgCl₂ (238)

0.05	32
0.1	33
0.15	33

HgI₂ (238)

0.1	29.4
0.2	29.7
0.3	29.9

HgCH₃Cl (238)

0.1	29
0.2	31

HgCH₃I (238)

0.1	30.1
0.2	32.5

CuCl (238)

0.1	23
0.2	24
0.4	24

CuCl₂ (238)

0.2	34.7
0.4	31.5

CuBr (238)

0.1	29.2
0.2	30.7
0.3	32.1
0.35	32.9

C₂H₆S (56)

Ethyl hydrogen sulfide
 $T_B = 307.8$
 $k_B = 30.6^*$

* No experimental data given.

C₃H₅N

Propionitrile

$T_B = 370.2$

$k_B = 34.4$

C₂H₅NO (220)

Acetamide

0.2 34.4

0.3 34.2

0.4 34.1

0.45 34.1

C₄H₅NO₂ (220)

Methylcyanoacetate

0.1 31.3

0.2 31.6

0.3 31.8

0.35 31.9

C₇H₆O₂ (34)

Benzoic acid

C₇H₆O₂—(Cont'd)

N	$\frac{\Delta t_B}{x_1}$
0.25	47
0.4	44
0.5	42

C₇H₈O₂ (220)

Dimethylpyrone

0.15 34.6

0.25 34.8

0.35 35.1

0.5 35.5

0.6 35.9

C₈H₇N (220)

Benzyl cyanide

0.15 33.2

0.2 33.8

0.25 34.4

C₈H₂₀IN (220)

Tetraethylammonium iodide

0.05 51.4

0.08 49.2

0.1 48.2

0.12 47.4

0.15 46.5

C₁₀H₈ (220)

Naphthalene

0.1 34

0.2 34.6

0.3 34.8

0.4 35.2

0.5 35.4

0.6 35.5

0.7 35.7

C₁₂H₁₁N (220)

Diphenylamine

0.1 34.0

0.2 34.5

0.3 34.9

0.4 35.4

0.5 35.8

0.6 36.3

C₁₄H₁₀O₂ (34)

Benzil

0.1 42

0.2 42

C₃H₆O

Acetone

$T_B = 329.2$

$k_B = 29.8$

I₂ (49)

0.1 34.0

0.2 34.9

0.3 35.6

0.4 36.3

NH₄CNS (114)

0.2 26.5

0.4 25.0

0.6 23.5

CH₄N₂O (152)

Urea

0.15 28

C₂H₂Br₄ (222)

1, 1, 2, 2-Tetrabromoethane

C₂H₂Br₄—(Cont'd)

N	$\frac{\Delta t_B}{x_1}$
0.2	29.4
0.4	29.9
0.6	30.4

C₂H₂Cl₃NO (152)

Trichloroacetamide

0.7 35.5

0.8 36.1

0.9 36.6

1.0 36.6

C₂H₃ClO₂* (206)

Chloroacetic acid

0.2 26.0

0.4 28.3

0.6 29.2

C₂H₃Cl₃O₂ (65)

Chloral hydrate

0.2 30.6

0.4 31.0

0.6 31.3

C₂H₃Cl₂NO (152)

Dichloroacetamide

0.4 32.6

0.6 33.9

0.8 35.2

C₂H₄CINO (152)

Chloroacetamide

0.8 30.7

1.0 30.5

1.2 30.1

C₂H₅NO (153)

Acetamide

0.4 28.5

0.6 27.3

0.8 26.2

1.0 24.9

C₂H₅NO₂ (153)

Glycolamide

0.15 30.5

0.2 29.9

C₃H₄Br₂O₂* (206)

1, 2-Dibromopropionic acid

0.1 33.4

0.2 30.5

0.3 27.5

C₃H₄Cl₃NO₂ (152)

Trichlorolactamide

0.4 31.3

0.6 32.7

0.8 33.2

0.9 33.0

C₃H₇NO (153)

Propionamide

0.4 28.5

0.6 27.5

0.8 26.5

1.0 25.5

C₃H₇NO₂ (153)

Lactamide

C₇H₆O₃ (81) Salicylic acid		C₈H₁₄O₅—(Cont'd)		C₁₂H₁₀ (81) Diphenyl		C₂₄H₂₄N₂ (236) Dibenzyltetra- hydrodipyridyl		C₃H₆O₂ Propionic acid $T_B = 414.2$ $k_B = 47.4$		C₁₄H₁₀O₂ (34) Benzil	
N	Δt_B	N	Δt_B	N	Δt_B	N	Δt_B	N	Δt_B	N	Δt_B
	x_1		x_1		x_1		x_1		x_1		x_1
0.4	31.6	0.8	29.8	0.2	29.5	0.04	30.1	0.1	57.9	0.1	29.4
0.6	32.9	1.0	30.5	0.4	30.0	0.06	31.6	0.2	56.2	0.2	28.9
0.8	34.2	C₈H₁₄O₆ (221)		0.6	30.4	0.07	32.4	0.3	55.2	0.3	28.5
1.0	35.0	Diethyl tartrate		0.8	30.9	C₅₁H₉₈O₆ (222)		0.4	54.3		
1.4	38.2	0.2	23.5	1.0	31.3	Tripalmitin					
C₇H₇NO (152)		0.4	27.4	C₁₂H₁₀N₂ (139, 180)		0.02	31				
Benzamide		0.6	28.7	Azobenzene		0.04	30				
0.4	30.3	0.8	29.5	0.14	30.6	0.06	30				
0.6	30.1	C₉H₁₁NO (153)		0.37	28.9	0.08	29				
0.8	29.9	Methylacetanilide		C₁₂H₁₁N (139)		0.1	29				
1.0	29.6	0.3	30.4	Diphenylamine		0.15	27				
1.3	29.3	0.4	30.3	0.3	28.9	C₅₇H₁₁₀O₆ (222)					
C₇H₇NO (153)		0.6	30.0	0.5	29.9	Tristearin					
Formanilide		C₉H₁₁NO₂ (153)		C₁₂H₂₈IN (214)		0.02	33				
0.2	32.1	Lactanilide		Tetrapropylam-		0.04	32				
0.4	30.4	0.4	30.6	monium iodide		0.06	31				
0.6	30.5	0.5	30.3	0.1	32.5	0.08	28				
C₇H₇NO₂ (152)		0.6	30.1	0.2	29.3	CdI₂ (114)					
Salicylamide		C₉H₁₁NO₂ (153)		0.3	26.0	0.1	24.0				
0.4	33.6	Phenylurethane		C₁₂H₂₈N₂O₃ (214)		0.2	22.8				
0.6	35.1	0.2	32.3	Tetrapropylam-		0.3	22.0				
0.8	36.6	0.4	31.9	monium nitrate		0.4	21.4				
C₇H₈N₂O (153)		0.6	31.6	0.2	30.0	HgCl₂ (114)					
Phenylurea		0.7	31.4	0.4	25.0	0.2	30.6				
0.2	28.6	C₉H₂₂BrN (270)		0.6	23.2	0.3	30.5				
0.4	26.2	Tripropyl-		0.8	22.0	0.4	30.4				
0.6	23.8	ammonium bromide		C₁₃H₁₁NO (152)		CuCl₂ (144)					
C₈H₈O₃ (176)		C₉H₂₂ClN (270)		Benzanilide		FeCl₃ (264)					
<i>l</i> -Mandelic acid		Tripropyl-		0.4	31.9	0.07	34.4				
0.2	29.5	ammonium chloride		0.6	31.5	0.1	33.7				
C₈H₈O₃ (176)		C₁₀H₇NO₂ (142)		C₁₃H₁₂N₂O (153)		0.15	30.2				
<i>dl</i> -Mandelic acid		1-Nitronaphthalene		Diphenylurea		CrCl₃·6H₂O (green)					
0.15	22.8	0.15	28.7	0.15	29.2	(177)					
0.2	30.8	0.16	28.2	C₁₄H₁₀O₂ (125)		0.02	33.0				
C₈H₉NO (152)		C₁₀H₈ (18)		Benzil		0.04	30.5				
Acetanilide		Naphthalene		0.1	26.8	0.06	29.0				
0.4	32.1	0.4	28.6	0.2	27.6	0.08	26.5				
0.6	33.3	0.6	27.7	0.3	28.4	MoO(OH)₂Cl₂					
0.8	34.1	0.8	27.2	C₁₅H₃₄BrN (270)		(215)					
C₈H₉NO (153)		1.0	26.8	Triamylammonium		0.2	26.4				
Phenylacetamide		1.5	26.2	bromide		0.4	28.3				
0.4	28.3	1.8	26.0	C₁₅H₃₄ClN (270)		C₆H₁₅BO₈ (85)					
0.6	27.6	C₁₀H₁₀O₄ (81)		Triamylammonium		Mannitoboric acid					
0.7	27.3	Resodiaceto-		chloride		0.26	22.6				
C₈H₉NO₂ (153)		phenone		C₁₆H₃₄N₂S (270)		LiCl (78)					
Glycolanilide		0.1	31.5	Triamylammonium		LiNO₃ (119)					
0.3	29.4	0.3	29	thiocyanate		0.1	24.2				
0.4	29.5	C₁₀H₁₃NO (153)		C₁₉H₂₁NO₅ (240)		0.2	20.6				
0.6	29.7	Ethylacetanilide		Trimethylcolchi-		0.3	18.5				
C₈H₁₂O₆ (221)		0.2	30.1	cinic acid		0.4	17.4				
Dimethyl acetyl-		0.4	29.8	0.05	31.2	0.5	16.4				
malate		0.6	31.7	0.1	31.1	1.0	14.2				
0.2	25.5	C₁₀H₁₆N₂O₃ (100)		C₂₀H₁₀Br₄O₄ (155)		NaI (147)					
0.4	28.5	Bornylene nitrosite		Tetrabromophenol-		0.1	28.7				
0.6	29.8	0.1	17.4	phthalein		0.2	29.1				
0.7	30.3	0.2	18.6	C₂₀H₄₄IN (270)		0.4	29.8				
C₈H₁₄O₆ (221)		C₁₀H₁₆O (18)		Tetraamyl-		0.6	30.6				
Diethyl malate		Camphor		ammonium iodide		0.8	31.4				
0.2	23.5	0.2	29.4	C₂₂H₄₂O₃ (222)		* Stable, high melting					
0.4	27.4	0.4	29.2	Isobutyl ricinoleate		form.					
0.6	28.9	0.6	28.9	0.2	30.0						
		0.8	28.7	0.4	29.5						
		1.0	28.4								
		1.5	27.8								

* The isomer used is not given.

C₃H₆O₂ Ethyl formate $T_B = 327.4$ $k_B = 29.9$		C₁₂H₁₁N (34, 202) Diphenylamine	
N	Δt_B	N	Δt_B
	x_1		x_1
0.1	57.9	0.2	27.8
0.2	56.2	0.4	27.8
0.3	55.2	0.6	27.7
0.4	54.3	0.8	27.7
		1.0	27.6
		1.2	27.6
		1.4	27.5
		C₁₃H₁₀O₂ (34)	
		Phenyl benzoate	
		0.1	27.8
		0.3	27.5
		0.5	27.1
		0.7	26.8
		C₁₄H₁₀O₂ (34, 202)	
		Benzil	
		0.05	28.0
		0.1	27.9
		0.2	27.6
		0.3	27.1
		0.5	26.3
		0.6	25.8

C₃H₆O₂—(Cont'd)**C₁₅H₃₄BrN* (270)**Triamylammonium
bromide**C₁₅H₃₄ClN* (270)**Triamylammonium
chloride**C₁₅H₃₄FN* (270)**Triamylammonium
fluoride**C₁₆H₃₄N₂S* (270)**Triamylammonium
thiocyanate**C₁₈H₃₁N₄O₇* (270)**Tetrapropyl-
ammonium picrate**C₂₀H₄₄IN* (270)**Tetraamyl-
ammonium iodide**SnCl₂ (195, 202)**

N	$\frac{\Delta t_B}{x_1}$
0.05	49.2
0.1	46.2
0.15	43.3
0.2	40.4

Zn(NO₃)₂ (195, 202)

0.05	34.6
0.1	32.6
0.15	30.6
0.2	28.5
0.25	26.5

CdI₂ (195, 202)

0.01	59.5
0.02	58.0
0.03	56.6
0.04	55.1

HgCl₂ (195, 202)

0.05	31.7
0.1	31.4
0.3	30.7
0.5	30.4
0.7	30.3

HgBr₂ (195, 202)

0.05	34.4
0.1	32.9
0.2	31.6
0.3	31.3
0.4	31.0
0.5	30.8

HgI₂ (195, 202)

0.04	28.1
0.05	28.4
0.06	28.7

CuCl₂ (195, 202)**CuBr₂ (195)****CoBr₂ (195, 202)**

0.05	58.3
0.1	53.5
0.15	48.7
0.2	44.0

Co(NO₃)₂ (195, 202)

N	$\frac{\Delta t_B}{x_1}$
0.02	50.6
0.05	46.4
0.1	39.1
0.15	31.9

Ca(NO₃)₂ (195, 202)

0.02	48.6
0.05	44.7
0.1	38.0
0.15	31.5
0.2	25.0
0.25	19.6

BaI₂ (195)

0.02	54.3
0.05	44.5
0.08	34.7
0.1	28.0

LiCl (195)

0.03	36.9
0.04	31.2

LiBr (195, 202)

0.1	47.3
0.2	40.3
0.4	32.5
0.6	28.8
0.8	26.7
1.0	25.5

LiI (195, 202)

0.05	50.2
0.1	44.3
0.15	40.7
0.2	38.3
0.25	36.4

LiCNS (195, 202)

0.02	56.7
0.05	51.6
0.08	46.4
0.1	42.8

NaCNS (195, 202)

0.02	50.8
0.05	46.6
0.08	42.3
0.1	39.3
0.12	36.6

KCNS (195, 202)

0.02	50.6
0.04	48.3
0.05	47.3

* Associated.

C₃H₇Br*n*-Propyl bromide $T_B = 344.0$ $k_B = 29.5$ **C₇H₆O₂ (266, 267)**

Benzoic acid

0.1	19.4
0.5	18.3
1.0	17.0

C₈H₈NO (266, 267)

Acetanilide

0.3	21.4
0.5	19.0
1.0	13.6

C₁₀H₁₅BrO*Bromocamphor
(266, 267)

N	$\frac{\Delta t_B}{x_1}$
0.1	29.6
0.5	30.3
0.7	30.6

* The isomer used is
not given.**C₃H₈O***n*-Propyl alcohol $T_B = 370.9$ $k_B = 27.0$ **C₃H₇NO₂ (201)**

Urethane

0.1	25.2
0.2	25.2
0.4	25.1
0.6	25.0
0.8	24.9
1.0	24.8
1.2	24.7

C₆H₃N₃O₇ (265)

Picric acid

0.3	25.1
0.5	24.1
1.0	21.5
1.5	19.0

C₆H₆N₂O₂ (34)*p*-Nitroaniline

0.2	25.1
0.5	25.7
0.8	26.2
1.0	26.5

C₇H₆O₂ (34)

Benzoic acid

0.1	25.7
0.2	25.9
0.4	26.3
0.6	26.7
0.8	26.8
1.0	26.9

C₇H₆O₃ (192)

Salicylic acid

0.1	29.3
0.2	29.4
0.4	29.6
0.6	29.8
0.8	30.1
1.0	30.5
1.2	30.9

C₈H₈O₃ (34)

Anisic acid

0.2	27.7
0.3	27.5
0.6	27.1
0.8	26.9
1.0	26.8

C₁₀H₈ (201)

Naphthalene

0.1	24.0
0.2	23.6
0.4	22.9
0.6	22.4
0.8	22.0
1.0	21.6
1.2	21.3

C₁₀H₁₆O (34)

Camphor

N	$\frac{\Delta t_B}{x_1}$
0.1	24.4
0.2	24.4
0.4	24.4
0.6	24.4
0.8	24.4
1.0	24.4

C₁₂H₁₀ (201)

Acenaphthene

0.1	24.9
0.2	24.5
0.3	24.1
0.4	23.8
0.5	23.5
0.6	23.3
0.7	23.1

C₁₄H₁₀O₂ (34)

Benzil

0.05	29.8
0.1	29.1
0.2	27.7
0.3	26.6
0.4	25.7
0.5	25.1
0.7	24.1

LiCl (192)

0.9	24.8
1.0	26.5
1.1	28.5
1.2	30.8

LiC₇H₅O₃ (192)

Salicylate

0.1	15.9
0.2	15.9
0.4	15.8
0.7	15.3
1.0	15

NaI (192)

0.2	29.4
0.4	29.5
0.7	29.5
1.0	29.6

C₃H₈O (173)

Isopropyl alcohol

 $T_B = 355.4$ $k_B = 21.5^*$ * Calculated from the
average of results ob-
tained by using aniline,
benzanilide and dimeth-
ylaniline as solutes. No
experimental data given.**C₃H₈O₂**

Methylal

 $T_B = 317$ $k_B = 27.4$ **I₂ (30)**

0.1	25.8
0.2	26.8
0.3	27.9

C₇H₆O₂ (34)

Benzoic acid

C₇H₆O₂—(Cont'd)

N	$\frac{\Delta t_B}{x_1}$
0.1	26.2
0.2	26.4
0.3	26.6
0.5	27.1
0.8	27.7
1.0	28.2

C₇H₇NO (34)

Formanilide

0.1	24.1
0.2	23.8
0.3	23.4
0.5	22.8
0.8	21.8

C₁₀H₈ (34)

Naphthalene

0.1	27.2
0.2	27.2
0.3	27.2
0.5	27.2

C₁₀H₁₆O (34)

Camphor

0.1	27.5
0.2	27.5
0.5	27.5
0.6	27.5

C₁₀H₂₀O (34)

Menthol

0.1	27.3
0.2	27.2
0.3	27.1
0.4	26.9

C₁₄H₁₀O₂ (30)

Benzil

0.1	24.7
0.2	25.7
0.3	26.7

C₄H₆O₃

Acetic anhydride

 $T_B = 412.7$ $k_B = 36$ **C₁₄H₁₀O₂ (44)**

Benzil

0.02	36
0.05	36
0.1	35
0.15	35

C₄H₈O₂*n*-Butyric acid $T_B = 436.6$ $k_B = 44.8$ **C₇H₅BrO₂ (29)***p*-Bromobenzoic
acid

0.1	43.6
0.2	42.8
0.5	40.4
0.8	38.0

C₁₂H₁₁N (29)

Diphenylamine

0.1	44.2
0.2	43.5
0.35	42.4

C₁₃H₁₁NO (29)

Benzanilide

C₁₃H₁₁NO—(Cont'd)

N	$\frac{\Delta t_B}{x_1}$
0.1	43.1
0.2	41.6
0.3	40.0
0.5	36.9

C₁₄H₁₀O₂ (29)

Benzil

0.2	42.0
0.3	40.4
0.5	37.1

NaC₄H₇O₂ (29)*n*-Butyrate

0.1	47.1
0.2	49.3
0.3	49.4

C₄H₈O₂

Ethyl acetate

 $T_B = 350.2$ $k_B = 31$ **I₂ (30)**

I_2 (%)	
0.05	32.4
0.1	32.7
0.2	33.4
0.3	34.1

* The isomer used is not given.

C₄H₁₀O—(Cont'd)

LiBr (211)	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	27
0.4	25.4
0.5	25.7
0.7	26.3
LiI (211)	
0.1	26.5
0.2	25.0
0.3	24.9
0.5	25.7
LiNO ₃ (211)	
0.1	24.1
0.2	23.7
0.3	23.4
0.5	22.6

C₄H₁₀O
tert.-Butyl alcohol
T_B = 355.9
k_B = 18*

CH ₄ N ₂ S (8)	
Thiourea	
0.1	17.8
0.15	18.7
C ₆ H ₄ Br ₂ (8)	
<i>p</i> -Dibromobenzene	
0.1	19.5
0.2	20.7
0.3	21.9
0.5	24.2

* See ternary and four- and five-component systems.

C ₄ H ₁₀ S	
Ethyl sulfide	
<i>T_B</i>	364.7
<i>k_B</i>	35.8
C ₁₂ H ₁₁ N (238)	
Diphenylamine	
0.05	36.1
0.1	36.4
0.2	37.0
SnCl ₂ (238)	
0.1	38.9
0.2	39.3
SnBr ₂ (238)	
0.05	35.5
0.1	41.0
0.15	43.0
CdI ₂ (238)	
0.05	35.5
0.1	35.7
0.2	36.0
HgCl ₂ (238)	
0.1	35.6
0.2	35.2
0.3	34.7
HgI ₂ (238)	
0.05	35.4
0.1	36.1
0.15	36.8

HgCH ₃ Cl (238)	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	35.8
0.2	36.1
0.25	36.3
HgCH ₃ I (238)	
0.1	36.1
0.2	36.5
0.3	36.9
CuCl (238)	
0.05	29.3
0.1	28.3
0.2	26.3
0.4	22.4
CuBr (238)	
0.1	23.4
0.2	23.5
0.3	23.6
0.4	23.7

C ₅ H ₅ N	
Pyridine	
<i>T_B</i>	388.4
<i>k_B</i>	36†
C ₄ H ₆ O ₄ (106)	
Succinic acid	
0.1	34.7
0.2	35.8
0.4	38.2
0.7	41.6
C ₄ H ₆ O ₆ (105)	
Tartaric acid	
0.1	34.8
0.4	35.3
0.8	35.9
C ₄ H ₁₂ CIN (214)	
Diethylammonium chloride	
0.1	34.6
0.3	35.1
0.5	35.6
0.6	35.9
C ₆ H ₃ N ₃ O ₇ (245)	
Picric acid	
0.15	47.2
0.2	47.3
0.25	47.9
0.3	49.4
C ₆ H ₆ O ₂ (105)	
Resorcinol	
0.05	36
0.2	37.6
0.4	39.9
C ₆ H ₁₆ CIN (214)	
Triethylammonium chloride	
0.1	34.6
0.2	34.9
0.26	35.0
C ₇ H ₆ O ₃ (105, 191)	
Salicylic acid	
0.05	37.0
0.1	37.2
0.3	38.0
0.5	38.9
0.9	40.5

C ₇ H ₉ N (184)	
<i>p</i> -Toluidine	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	38.9
0.2	39.1
0.5	39.9
0.8	41.0
1.0	41.8
C ₈ H ₂₀ IN (230)	
Tetraethylammonium iodide	
0.025	28.2
0.05	25.8
C ₁₀ H ₈ O (105)	
β -Naphthol	
0.1	36.6
0.2	36.9
0.35	37.5
0.5	38.3
0.7	39.5
C ₁₂ H ₅ N ₇ O ₁₂ (245)	
Hexanitrodiphenylamine	
0.05	49.5
0.1	58.2
0.15	63.4
C ₁₂ H ₁₀ (184)	
Diphenyl	
0.2	42
0.3	42.3
0.4	42.5
0.6	42.8
0.8	43.1
C ₁₂ H ₁₁ N (230)	
Diphenylamine	
0.1	37
0.3	37
0.6	37
C ₁₃ H ₁₀ O (105)	
Benzophenone	
0.1	39.9
0.2	39.5
0.3	39.1
0.5	38.6
C ₁₄ H ₁₀ (169)	
Anthracene	
0.01	36
0.02	35.6
0.04	34.4
C ₁₄ H ₁₀ (230)	
Phenanthrene	
0.1	33.7
0.2	34.0
0.3	34.3
0.4	34.6
0.5	35.0
C ₁₄ H ₁₀ O ₂ (191)	
Benzil	
0.1	33.0
0.2	33.8
0.3	34.3
0.4	34.6
0.5	35.0
0.6	35.2

C ₁₈ H ₂₀ N ₂ O ₄ (105)	
Tartaric ditoluide	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	36
0.1	36
C ₁₉ H ₁₆ (184)	
Triphenylmethane	
0.05	39
0.1	39.3
0.2	39.5
0.3	39.8
0.5	40.5
C ₁₉ H ₁₈ O ₁₁ (191)	
Euxanthic acid	
C ₂₀ H ₁₆ IN (95)	
<i>N</i> -Methylphenylacridinium iodide	
0.04	36.3
0.08	37.8
C ₂₃ H ₂₄ O ₆ (191)	
Mangostin	
0.05	32.5
0.1	31.8
0.15	31.3
SnCl ₂ (238)	
0.05	39
0.1	38
0.2	37
SnBr ₂ (238)	
0.02	40.2
0.05	40.1
0.08	40.0
0.1	39.8
0.15	38.6
Pb(NO ₃) ₂ (238)	
0.04	36.4
0.08	36
0.12	35
ZnCl ₂ (238)	
0.05	42.1
0.1	41.0
0.15	39.9
0.2	39.0
ZnBr ₂ (238)	
0.05	47.0
0.1	47.0
0.15	47.0
CdI ₂ (238)	
0.02	35.9
0.05	39.2
0.08	42.5
HgCl ₂ (194, 230)	
0.05	34.2
0.1	34.6
0.2	35.5
0.5	38.2
0.7	40.0
0.9	41.8
HgBr ₂ (230)	
0.05	33.2
0.1	33.5
0.2	34.2
0.3	35.0
0.4	35.9
0.5	36.9
0.6	37.9

HgI ₂ (230)	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	35.0
0.2	35.7
0.3	36.3
0.4	36.9
0.5	37.6
Hg(CN) ₂ (230)	
0.05	34.2
0.1	34.8
0.2	36.2
0.4	38.5
0.5	39.6
0.7	41.5
HgC ₂ H ₅ Cl (230)	
0.1	34
0.2	34.3
0.4	35.1
0.6	36.0
CuCl (238)	
0.05	31.5
0.1	31.6
0.2	31.7
0.3	30.8
CuCl ₂ * (238)	
0.1	37.9
0.2	37.6
0.3	37.3
CuBr (238)	
0.04	36.8
0.08	36.9
0.15	37.1
0.2	37.2
CuCN (238)	
0.01	19.5
0.03	19.3
0.05	19.1
0.1	18.8
0.15	18.5
AgNO ₃ (194)	
0.1	30.6
0.25	28.0
0.4	26.9
0.5	26.9
0.7	27.3
0.9	28.3
1.0	29.6
AgCN (194)	
0.05	22.4
0.12	23
AgCNS (194)	
0.02	36.3
0.05	34.9
0.1	32.8
FeCl ₂ * (238)	
0.02	43.0
0.05	45
FeCl ₃ (77, 238)	
0.05	42.3
0.1	42.0
0.3	40.8
0.5	39.6
0.7	38.4
0.9	37.3

CoCl ₂ (238)	
<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.03	38.4
0.05	39.0
0.08	39.9
0.1	40.4
CoBr ₂ (238)	
0.02	40.2
0.05	39.7
0.08	39.3
0.1	39.1
0.15	38.7
AlCl ₃ (238)	
0.05	40.0
0.08	40.1
0.1	40.2
0.2	40.9
BeCl ₂ (184)	
0.1	37.7
0.2	39.2
0.3	41.0
0.4	43.4

* Schroeder (194) failed to get any rise in boiling point.

† Samples of pyridine, unless very carefully purified, show unusually marked anomalies in boiling pt. It is recommended that the constant be determined for the particular sample employed, cf. (191). Suitable solutes are anthracene, diphenyl, phenanthrene and triphenylmethane.

C ₅ H ₁₀	
Cyclopentane	
<i>T_B</i>	322.6
<i>k_B</i>	29.5
C ₁₀ H ₁₀ O (81)	
Benzylideneacetone	
0.3	27.7
0.5	25.4
1.0	21.7
C ₁₀ H ₁₄ O ₂ (81)	
Resorcinol diethyl ether	
0.5	30.8
1.0	32.0
1.5	33.1
C ₁₂ H ₁₀ (81)	
Diphenyl	
0.3	30.8
0.5	31.5
0.7	32.1
0.9	32.8
C ₅ H ₁₀	
β -Amylene	
<i>T_B</i>	309.5
<i>k_B</i>	27.6

$C_2HCl_3O_2$ (255) Trichloroacetic acid	
N	$\frac{\Delta t_B}{x_1}$
0.1	24.2
0.2	20.4
0.3	18.1
0.45	16.8
$C_2H_2Cl_2O_2$ (255) Dichloroacetic acid	
0.1	8.2
0.2	7.9
0.5	7.3
$C_7H_6O_2$ (255) Benzoic acid	
0.25	13.1
0.3	13.5
0.4	14.2
$C_7H_{11}Cl_3O_2$ (255) Amyl trichloroacetate	
0.05	26.5
0.1	27.6
0.2	28.5
0.6	29.5
0.9	29.5
$C_{10}H_8$ (255) Naphthalene	
0.1	27.8
0.2	28.0
0.3	28.2
$C_5H_{10}O$ Diethyl ketone $T_B = 374.8$ $k_B = 32$	
$C_7H_6O_2$ (268) Benzoic acid	
0.64	31.4
$C_{10}H_8$ (268) Naphthalene	
0.56	32.4
$C_{28}H_{56}O_4$ (268) Polyheptaldehyde	
0.15	67.2
0.3	64.6
0.5	60
$C_5H_{10}O$ Methyl propyl ketone $T_B = 374.8$ $k_B = 38$	
$C_7H_6O_2$ (34) Benzoic acid	
0.1	41.1
0.2	40.3
0.3	39.5
0.4	38.7
0.5	37.9
0.6	37.1
$C_{14}H_{10}O_2$ (34) Benzil	
0.1	37
0.2	37.1
0.3	36.8

$C_5H_{11}N$ Piperidine $T_B = 378.9$ $k_B = 33.0$	
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$C_{12}H_{11}N$ (238) Diphenylamine	
N	$\frac{\Delta t_B}{x_1}$
0.1	32.8
0.2	33.5
0.4	34.6
0.6	35.5
0.75	35.9
$C_{14}H_{10}$ (238) Anthracene	
0.1	33.8
0.2	34.4
0.3	35.0
$ZnCl_2$ (238)	
0.05	35
0.07	33.8
0.1	31.8
0.2	27.0
$CdBr_2$ (238)	
0.05	33.0
0.1	32.3
0.15	31.7
0.25	30.1
0.35	28.4
CdI_2 (238)	
0.05	36.4
0.1	35.4
0.2	33.6
0.3	32.2
0.35	31.6
$AgCl$ (238)	
0.05	14.7
0.1	14.5
0.17	13.5
$AgBr$ (238)	
0.05	14.4
0.1	14.5
0.2	14.7
AgI (238)	
0.03	17.0
0.09	16.5
$AgNO_3$ (238)	
0.05	33
0.1	27
0.15	22
0.2	20
0.3	16
0.35	15
$CoCl_2$ (238)	
0.04	30.0

$C_5H_{12}O$ Isoamyl alcohol $T_B = 403.6$ $k_B = 30.5$	
$C_4H_{12}ClN$ (214) Diethylammonium chloride	
$C_4H_{12}ClN$ (214) Isobutylammonium chloride	
$C_6H_6O_3$ (211) Pyrogallol	
$C_6H_{16}BrN$ (214) Triethylammonium bromide	

$C_6H_{16}ClN$ (214) Triethylammonium chloride	
$C_6H_{16}IN$ (214) Triethylammonium iodide	
$C_7H_5NO_4$ (208) <i>o</i> -Nitrobenzoic acid	
N	$\frac{\Delta t_B}{x_1}$
0.1	28.8
0.2	28.8
0.5	28.9
$C_7H_6O_3$ (3, 208) Salicylic acid	
0.1	29.9
0.2	31.0
0.4	33.0
0.6	35.1
$C_7H_{16}O_4S_2$ (208) Sulfonal	
0.1	28.6
0.2	28.5
0.3	28.4
$C_8H_{12}ClN$ (214) Ethylphenylammonium chloride	
0.2	15.0
0.3	18.0
0.4	18.4
0.5	18.5
0.7	18.6
$C_8H_{20}BrN$ (214) Tetraethylammonium bromide	
0.2	20.2
0.3	20.2
0.5	20.2
$C_8H_{20}ClN$ (214) Tetraethylammonium chloride	
0.4	22.6
0.6	25.1
0.8	28.3
1.0	31.4
$C_8H_{20}IN$ (214) Tetraethylammonium iodide	
0.1	22.0
0.2	17.6
$C_9H_8O_2$ (208) Cinnamic acid	
0.1	30.9
0.2	30.3
0.3	29.8
0.4	29.3
$C_{11}H_{12}IN$ (214) <i>N</i> -Quinoline ethiodide	
$C_{12}H_{11}N$ (208) Diphenylamine	
0.2	28.5
0.3	28.8
0.4	29.0
0.6	29.5

$C_{12}H_{28}IN$ (214) Tetrapropylammonium iodide	
$C_{12}H_{28}N_2O_3$ (214) Tetrapropylammonium nitrate	
$C_{14}H_{10}O_2$ (34) Benzil	
N	$\frac{\Delta t_B}{x_1}$
0.1	30.8
0.2	30.4
0.3	29.6
$C_{14}H_{10}O_9$ (208) Tannin	
0.02	27.2
0.05	27.4
0.1	27.8
$C_{20}H_{24}N_2O_2$ (208) Quinine	
0.1	28.3
0.15	27.8
$(C_{20}H_{24}N_2O_2)_2 \cdot H_2SO_4$ (208) Quinine sulfate	
0.01	34.2
0.02	34.9
0.05	36.8
0.07	38.1
$LiCl$ (211)	
0.1	30.5
0.5	30.9
1.3	31.7
$LiBr$ (211)	
0.2	28.8
0.3	28.1
0.5	28.9
0.7	31.1
LiI (211)	
0.1	26.0
0.5	27.3
0.9	28.6
$LiNO_3$ (211)	
0.1	26.7
0.2	26.0
0.5	23.7
$NaC_5H_{11}O$ (208) Isoamylate	
0.2	31
0.4	33
0.6	35
$KC_2H_3O_2$ (208) Acetate	
0.2	31.0
0.3	31.3
0.5	31.7
$C_5H_{12}O$ <i>tert.</i> -Amyl alcohol $T_B = 374.9$ $k_B = 25.6$	
$C_4H_{12}ClN$ (214) Diethylammonium chloride	
0.15	24.8
0.25	22.5
0.35	21.1

$C_{14}H_{10}O_2$ (34) Benzil	
N	$\frac{\Delta t_B}{x_1}$
0.15	25.7
0.2	25.9
0.25	26.4
C_6H_5Cl Chlorobenzene $T_B = 405.2$ $k_B = 42$	
$C_{12}H_{10}NO$ (237) 1-Benzoylpyridinium	
0.023	42.7
$C_{14}H_{10}O_2$ (237) Benzil	
0.027	41.7
$C_6H_5NO_2$ Nitrobenzene $T_B = 484.0$ $k_B = 42.6$ S_8 (55)	
0.1	42.4
0.2	42.0
As_4O_6 (55)	
0.03	36
0.05	37
$C_6H_6N_2O_2$ (55) <i>m</i> -Nitroaniline	
0.1	44.6
0.2	44.5
0.3	44.4
$C_8H_4O_3$ (55) Phthalic anhydride	
0.1	41.4
0.2	41.6
0.5	42.3
C_8H_9NO (55) Acetanilide	
0.1	40.2
0.2	40.2
0.35	40.1
$C_{10}H_{10}O_4$ (55) Dimethyl terephthalate	
0.2	36
0.3	37
$C_{12}H_9N$ (9) Carbazole	
0.1	42.2
0.2	42.2
0.35	42.3
0.5	42.4
$C_{12}H_{11}N$ (55) Diphenylamine	
0.1	41.4
$C_{12}H_{12}N_2$ (9) Benzidine	
0.1	39.6
0.2	40.3
0.35	41.6
$C_{13}H_{10}O_3$ (55) Phenyl salicylate	
0.1	36.6
0.2	36.4

$C_{14}H_8O_2$ (9) Anthraquinone	
N	$\frac{\Delta t_B}{x_1}$
0.05	42
0.1	42
0.2	41
$C_{14}H_8O_2$ (55) Phenanthraquinone	
0.1	42.4
0.2	42.3
$C_{14}H_8O_4$ (9, 55) Alizarin	
0.05	39.7
0.1	40.2
$C_{14}H_{10}$ (9) Anthracene	
0.1	40
0.2	40
0.35	40
$C_{14}H_{10}O_2$ (26, 31, 39) Benzil	
0.1	43.3
0.2	43.3
0.35	43.4
$C_{14}H_{10}O_3$ (9) Benzoic anhydride	
0.1	42.3
0.2	42.3
0.35	42.3
$C_{14}H_{12}O_2$ (55) Benzoin	
0.1	38.1
0.2	38.0
0.35	37.7
$C_{19}H_{16}$ (39) Triphenylmethane	
0.04	49.7
0.06	46.4
0.08	45.0
0.1	44.2
$C_{26}H_{22}$ (55) Tetraphenylethane	
0.05	41
$C_{36}H_{18}$ (79) Decacycene	
$C_{48}H_{28}$ (80) Fluorocyclene	
C_6H_6 Benzene $T_B = 353.35$ $k_B = 33.6$	
I_2 (30, 136, 217)	
0.05	34
0.1	34
0.2	34
0.3	34
0.5	36
1.0	37
2.0	36
5.07	27†

C₆H₆—(Cont'd)

S ₈ (4, 170)	
N	$\frac{\Delta t_B}{x_1}$
0.05	33.6
0.1	32.8
0.3	30.0
0.5	28.2
0.7	27.8
1.0	27.3
1.2	26.9
S ₂ Cl ₂ (164)	
0.1	31.3
0.2	32.5
N ₄ S ₄ (2)	
0.05	34.2
0.1	33.9
0.2	33.3
0.3	32.7
PCl ₃ (166)	
0.21	36
P ₄ N ₄ Cl ₈ (103)	
0.06	34.1
0.08	34.3
POCl ₃ (164, 166, 167)	
0.1	32
0.2	32
0.4	33
0.7	33
1.0	33
1.2	34
POBr ₃ (164)	
0.05	33.3
0.1	33.1
0.2	32.2
0.3	31.8
PSCl ₃ (164, 167)	
0.1	25.4
0.2	26.5
0.3	27.6
P ₂ O ₃ Cl ₄ (163)	
0.05	33.1
0.1	32.4
As ₂ I ₄ (259)	
0.03	32.3
0.04	32.2
C ₂ H ₂ Br ₄ (223)	
1, 1, 2, 2-Tetra-	
bromoethane	
0.05	33.8
0.1	33.8
0.2	33.8
0.4	33.7
C ₂ H ₂ Cl ₃ NO (152)	
Trichloroacetamide	
0.5	26.3
0.6	25.9
0.75	25.4
C ₂ H ₃ ClO ₂ * (206)	
Chloroacetic acid	
0.1	20.4
0.2	19.9
0.3	19.5
0.4	19.1
0.6	18.2

C₂H₄Br₂ (84)

1, 2-Dibromo-	
ethane	
N	$\frac{\Delta t_B}{x_1}$
0.1	30.6
0.15	30.4
C ₂ H ₄ ClNO (152)	
Chloroacetamide	
0.1	23.5
0.15	24.3
0.2	25.0
C ₂ H ₅ I (166)	
0.17	33
C ₃ H ₄ Br ₂ O ₂ * (206)	
1, 2-Dibromopro-	
pionic acid	
0.05	32
0.1	30.5
0.15	29.0
0.23	26.2
C ₃ H ₄ Cl ₃ NO ₂ (152)	
Trichlorolactamide	
0.2	25.4
0.25	24.1
0.3	23.0
C ₃ H ₅ ClO (166)	
Epichlorohydrin	
0.18	30.3
0.23	31.5
C ₃ H ₇ I (166)	
Isopropyl iodide	
0.19	32.3
C ₃ H ₇ NO (153)	
Propionamide	
0.2	22.8
0.3	21.5
0.4	20.2
0.5	18.8
0.7	16.2
C ₃ H ₇ NO ₂ (153)	
Urethane	
0.4	23.7
0.5	23.3
0.7	22.6
C ₄ H ₉ NO (153)	
n-Butyramide	
0.3	21.8
0.4	20.3
0.5	19.2
0.6	18.3
C ₄ H ₉ NO (153)	
Isobutyramide	
0.25	24.0
0.3	23.2
0.35	22.4
0.4	21.7
0.5	20.1
0.6	18.6
C ₅ H ₁₁ NO (153)	
Valeramide	
0.3	23.8
0.5	21.3
0.7	18.8

C₆HBr₅O₂ (51, 155)

Pentabromoresor-	
cinol	
N	$\frac{\Delta t_B}{x_1}$
0.04	33
0.07	34
0.1	34
0.12	35
C ₆ H ₃ N ₃ O ₇ (137)	
Picric acid	
0.05	32
0.1	31.5
0.2	31.2
0.3	31.0
0.4	30.7
0.5	30.4
C ₆ H ₅ Cl ₂ O ₂ P (163)	
Dichlorophosphoxy-	
phenolate	
0.09	34.9
0.18	36.2
C ₆ H ₅ NO ₃ (175)	
p-Nitrophenol	
0.2	31.5
0.3	29.2
0.4	27.0
0.5	25.2
C ₆ H ₆ Cl ₂ NOP (163)	
Dichlorophosphoxy-	
monoanilide	
0.04	33.5
0.1	31.2
0.15	29.5
0.25	26.5
C ₆ H ₆ N ₂ O ₂ (175)	
m-Nitroaniline	
0.2	32.2
0.3	31.2
0.4	30.3
0.5	29.5
C ₆ H ₆ O (12)	
Phenol	
0.1	30.9
0.2	30.8
0.3	30.7
0.5	30.4
C ₆ H ₆ O ₂ (175)	
Catechol	
0.25	31.8
0.3	31.3
0.4	30.3
0.5	29.3
0.6	28.2
C ₆ H ₆ O ₂ (175)	
Resorcinol	
0.1	34
0.15	32.8
0.2	31.7
0.25	30.3
0.35	27.3
C ₆ H ₇ N (146)	
Aniline	
0.3	34.5
0.4	33.1
0.5	31.8
0.6	30.4
0.7	29.0

C₆H₁₀O₅ (221)

Dimethyl malate	
N	$\frac{\Delta t_B}{x_1}$
0.1	30.4
0.2	27.7
0.3	27.2
0.4	26.7
0.5	26.4
0.6	26.1
0.8	25.7
C ₆ H ₁₀ O ₆ (106, 221)	
Dimethyl tartrate	
0.1	29.5
0.2	27.3
0.3	25.5
0.4	24.0
0.6	21.7
1.0	18.3
1.4	16.0
C ₆ H ₁₃ NO (153)	
Isobutylacetamide	
0.2	27.0
0.3	25.3
0.4	23.5
0.55	20.9
C ₇ H ₅ BrO ₂ (106)	
o-Bromobenzoic	
acid	
0.1	21
0.2	20
0.4	19
0.6	18.6
0.8	18.4
1.0	18.3
1.2	18.2
1.6	18.1
C ₇ H ₆ O ₂ (106)	
Benzoic acid	
0.1	21.1
0.3	19.8
0.5	19.0
0.8	18.8
1.0	18.8
1.5	18.7
2.0	18.6
C ₇ H ₆ O ₃ (18)	
Salicylic acid	
0.1	24.9
0.2	23.5
0.4	20.8
0.46	20.0
C ₇ H ₇ NO (152)	
Benzamide	
0.15	26.0
0.2	25.2
0.3	23.5
C ₇ H ₇ NO (153)	
Formanilide	
0.25	29.2
0.35	27.1
0.5	25.4
C ₇ H ₇ NO ₂ (152)	
Salicylamide	

C₇H₇NO₂—(Cont'd)

N	$\frac{\Delta t_B}{x_1}$
0.1	29.7
0.15	28.9
0.2	27.9
0.25	26.8
0.3	25.5
C ₇ H ₁₆ O ₄ S ₂ (187)	
Sulfonal	
0.18	33.4
C ₈ H ₈ O (81)	
Acetophenone	
0.3	32.4
0.4	33.1
0.5	33.5
0.6	33.8
0.7	34.1
0.75	34.2
C ₈ H ₈ O ₂ (175)	
Phenylacetic acid	
0.2	22
0.3	21.5
0.5	21.1
0.65	20.6
C ₈ H ₈ O ₃ (176)	
d-Mandelic acid	
0.07	21
0.1	21.6
0.12	22.0
0.15	22.6
C ₈ H ₈ O ₃ (176)	
l-Mandelic acid	
0.04	20.1
0.045	20.6
0.05	21.2
0.06	22.5
C ₈ H ₈ O ₃ (176)	
dl-Mandelic acid	
0.04	21.6
0.07	21.5
C ₈ H ₉ NO (18)	
Acetanilide	
0.1	29.0
0.2	26.3
0.3	23.7
0.4	21.4
0.5	19.5
0.6	18.0
0.7	16.7
C ₈ H ₉ NO (18)	
Acetophenone oxime	
0.1	29.4
0.2	27.2
0.3	25.6
0.4	24.6
0.5	23.8
0.6	23.3
C ₈ H ₉ NO ₂ (153)	
Glycolanilide	
0.15	27.8
0.2	25.6
0.25	23.7
0.35	20.5
C ₈ H ₁₁ N (166)	
Dimethylaniline	
0.14	33.5
0.2	34.1

C₈H₁₂O₆ (221)

Dimethyl	
acetylmaleate	
N	$\frac{\Delta t_B}{x_1}$
0.1	34.3
0.2	32.8
0.3	32.6
0.4	32.6
0.5	32.6
C ₈ H ₁₄ O ₆ (221)	
Diethyl maleate	
0.3	28.5
0.4	28.1
0.6	27.8
0.7	27.8
0.8	27.8
C ₈ H ₁₄ O ₆ (221)	
Diethyl tartrate	
0.2	26.7
0.4	25.2
0.5	24.5
0.7	23.0
C ₉ H ₁₀ O ₂ (18)	
Ethyl benzoate	
0.1	31.5
0.2	31.6
0.3	31.7
0.5	31.9
0.8	32.1
1.2	32.4
C ₉ H ₁₁ NO (153)	
Methylacetanilide	
0.3	33.4
0.4	33.5
0.5	33.6
0.6	33.7
C ₉ H ₁₁ NO ₂ (153)	
Lactanilide	
0.15	28.0
0.2	26.5
0.3	23.6
0.4	21.1
C ₉ H ₁₁ NO ₂ (153)	
Phenylurethane	
0.3	32.8
0.4	33.1
0.5	33.3
0.6	33.4
C ₉ H ₁₂ ClNO ₂ (223, 228)	
p-Toluidine chloro-	
acetate	
0.02	62.3
0.05	55.5
0.08	51.7
0.1	49.6
0.2	40.8
0.3	35.0
0.4	31.0
0.5	27.8
C ₁₀ H ₇ NO ₂ (142)	
α-Nitronaphthalene	
0.04	33.6
0.11	34.9

C₁₀H₈ (234) Naphthalene		C₁₂H₁₀ (234) Diphenyl		C₁₄H₈O₂ (155) Anthraquinone		C₁₆H₃₄N₂S (223) Triamylammonium thiocyanate		S₈ (170)		C₁₄H₁₀O₂ (31) Benzil	
<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$	<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.3	35.4	0.5	34.7	0.074	34.1	0.15	11.6	0.03	33.3	0.5	38.5
0.5	35.7	1.0	35.4			0.2	10.8	0.05	33.3	1.0	38.7
1.0	36.2	1.5	36.1	C₁₄H₁₀ (18) Anthracene		0.3	9.4	0.1	33.2	1.5	38.8
1.3	36.6	2.0	36.8	0.05	33.4	0.4	8.0	0.2	33.2	2.0	38.9
1.6	36.9	3.0	38.2	0.1	33.1			0.3	33.1	2.5	39.0
C₁₀H₈O (142) β -Naphthol		4.0	39.6	0.2	32.4	C₁₉H₁₃O (259) Phenylxanthyl		C₁₄H₈O₄ (21) Alizarin		C₁₆H₁₀N₂O₂ (35) Indigotin	
0.35	35.0	4.5	40.3	0.3	31.7	0.05	29.8	0.06	33.8	0.044	35.4
C₁₀H₁₂O (81) Anethole		C₁₂H₁₁AsO₂ (259) Diphenylarsenic acid		C₁₄H₁₀ (52, 106) Phenanthrene		0.07	29.1	0.1	33.6	C₁₉H₁₆ (39) Triphenylmethane	
0.3	34.1	0.06	34.8	0.05	33.0	C₁₉H₁₆ (259) Triphenylmethyl		0.2	33.2	0.05	39.4
0.4	34.8	C₁₂H₁₁N (106) Diphenylamine		0.1	33.1	0.07	20.6	0.3	32.9	0.1	34.4
0.5	35.4	0.1	30.6	0.2	33.1	0.1	20.5	C₁₄H₁₀O₂ (31, 88) Benzil		C₂₁H₂₁N (45) Tribenzylamine	
0.6	36.1	0.2	31.2	0.7	33.2	C₁₉H₁₆ (31) Triphenylmethane		0.06	37.7	0.04	39.7
0.7	36.8	0.5	32.0	1.0	33.3	0.1	33.9	0.1	37.7	0.07	39.9
0.8	37.5	0.7	31.8	1.2	33.3	0.2	34.2	0.15	37.7	0.1	40.0
0.9	38.1	0.9	31.4	C₁₄H₁₀O₂ (30) Benzil		0.3	34.6	0.2	37.8	C₂₄H₁₂S (79) Dinaphthalene- thiophene	
C₁₀H₁₂O₂ (81) <i>o</i> -Methoxy- <i>p</i> - methylaceto- phenone		C₁₂H₁₄O₄ (81) Ethylresodiaceto- phenone		0.1	33.6	C₁₉H₁₆O (261) Triphenylcarbinol		0.3	37.8	0.05	34.3
0.3	34.9	0.2	32.8	0.2	33.6	C₂₀H₁₃N₃O₇ (136) Anthracene picrate		0.35	37.9	0.08	33.4
0.5	35.1	0.35	33.3	0.3	33.6	0.05	64.4	C₁₆H₁₀N₂O₂ (88) Indigotin		C₃₆H₁₈ (79) Decacyclene	
0.7	36.0	0.5	35.7	C₁₄H₁₀O₃ (18) Benzoic anhydride		0.1	60.4	C₁₉H₁₆ (88) Triphenylmethane		0.03	34.3
C₁₀H₁₃NO (153) Ethylacetanilide		C₁₂H₁₈O₃ (64) Methyl camphocar- boxylate		0.05	33.2	0.2	53.8	0.05	37.5	0.04	33.6
0.2	34	0.35	32.5	0.1	32.5	0.3	51.0	0.1	37.4	0.05	32.8
0.4	35.5	0.4	32.8	0.2	31.2	0.4	49.2	0.15	37.3		
0.5	36.1	C₁₃H₁₀O (106) Benzophenone		0.3	30.2	C₂₁H₃₆N₄O₇ (223) Triamylammonium picrate		0.25	37.1	C₆H₁₂ Cyclohexane	
C₁₀H₁₆O (39, 75) Camphor		0.1	30	0.4	29.2	0.1	21.0	C₂₁H₁₆N₂ (61) Lophine		<i>T_B</i> = 354.5	
0.05	35.6	0.2	30	C₁₄H₁₁NO₂ (106) β -Benzilmonoxime		0.2	19.5	0.02	33.9	<i>k_B</i> = 32.6	
0.1	35.5	0.4	31	0.1	28.3	0.3	17.5	0.05	33.9	C₆H₆Cl₆ (151) Benzene hexa- chloride	
0.2	35.5	0.6	31	0.2	27.5	C₂₄H₂₀As₂ (259) Tetraphenylacodyl		0.1	33.9	0.05	31
0.3	35.4	0.8	31	0.3	26.8	0.035	32.1	0.15	40.0	0.1	31.8
C₁₀H₁₈O (18) Borneol		C₁₃H₁₀O₂ (18) Phenyl benzoate		0.4	26.1	C₂₄H₂₄N₂ (236) Dibenzyltetrahy- drodipyridyl		C₂₁H₂₁N (45) Tribenzylamine		0.15	32.2
0.08	33.3	0.05	33.2	C₁₄H₁₅NO₃ (223, 228) <i>p</i> -Toluidine salicylate		0.03	46	0.05	38.1	0.2	32.7
0.1	32.8	0.1	33.0	0.05	58.0	0.064	37.2	0.1	38.7	C₆H₁₀O (151) Cyclohexanone	
0.2	31.5	0.2	32.7	0.1	52.6	C₃₂H₆₄O₂ (81) Cetyl palmitate		0.16	39.2	0.1	33.0
0.3	30.8	0.3	32.4	0.15	48.7	0.15	40.0	C₆H₇N Aniline		0.2	33.3
0.6	30.0	0.5	32.1	0.2	46.9	0.3	47.2	<i>T_B</i> = 457.5		0.3	33.5
C₁₀H₂₁Cl₂NO₂ (223) Diisobutyl- ammonium dichlo- roacetate		C₁₃H₁₀O₃ (18) Phenyl salicylate		0.3	44.8	0.5	56.9	<i>k_B</i> = 38.8		0.4	33.8
0.05	18.3	0.06	30.6	C₁₄H₂₈O₂ (223) Myristic acid		C₅₇H₁₁₀O₆ (223) Tristearin		C₁₂H₁₁N (26) Diphenylamine		0.5	34.0
0.1	18.0	0.1	30.2	0.04	31.6	0.05	39.9	0.1	36.6	C₇H₁₂O (151) <i>o</i> -Methylcyclo- hexanone	
0.2	17.7	0.2	29.8	0.08	29.2	0.1	41.0	0.2	36.9	0.1	30.2
0.3	17.3	0.3	29.6	0.11	28.4	SnI₄ (223)		0.3	37.2	0.2	30.5
C₁₁H₁₄O (146) Propyl benzyl ketone		0.4	29.6	C₁₆H₁₁N₃O₇ (136) Naphthalene picrate		0.05	34.0	C₁₂H₁₁N₃ (156) Aminoazobenzene		0.3	30.8
0.15	34.9	0.5	29.6	0.1	68	0.1	33.1	0.25	37.0	0.4	31.2
C₁₁H₁₆O₃ (64) Camphocarboxylic acid		C₁₃H₁₁NO (152) Benzanilide		0.15	66	0.15	32.2	0.3	36.7	0.5	31.4
0.1	21.3	0.15	30.8	C₁₆H₁₁N₃O₈ (137, 223) β -Naphthol picrate		0.2	31.3	C₁₃H₁₁NO (21) Benzanilide		0.6	31.5
0.2	21.0	0.2	30.5					0.1	35.7	C₈H₈O (151) Acetophenone	
0.4	20.4	0.25	30.2					0.3	36.1	0.1	32.8
1.2	18.6	C₁₃H₁₁N₃O₉ (223, 228) Dimethylpyrone picrate						C₁₄H₈O₂ (156) Anthraquinone		0.2	33.2
		0.05	58.6					0.2	38.7	0.3	33.6
		0.1	56.3							0.4	33.8
		0.15	53.7							0.5	33.9
		0.2	50.6								
		0.26	46.2								

* Stable, high melting form.

C₆H₁₂—(Cont'd)**C₉H₁₂ClNO₂ (224)***p*-Toluidine chloroacetate

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	32.6

C₁₀H₈ (151)

Naphthalene

0.1	33.0
0.2	33.2
0.3	33.3
0.4	33.4
0.5	33.6
0.6	33.7

C₁₀H₁₂O (81)

Anethole

0.1	32.2
0.3	32.8
0.5	33.4
0.7	34.0
0.9	34.6
1.0	34.9

C₁₀H₂₁Cl₂NO₂

Diisobutylammonium dichloroacetate (224)

0.05	32.8
0.1	33.0
0.2	33.2

C₁₂H₁₀ (151)

Diphenyl

0.1	33.3
0.2	33.9
0.3	34.5

C₁₃H₁₀O (151)

Benzophenone

0.05	32.9
0.1	33.0
0.2	33.2
0.3	33.5

C₁₃H₁₀O₂ (151)

Phenyl benzoate

0.15	32.3
0.2	32.2
0.25	32.2

C₁₄H₁₀O₂ (151)

Benzil

0.05	34.0
0.1	35.4
0.15	36.8
0.2	38.1
0.25	39.5

C₁₄H₁₂ (151)

Stilbene

0.1	32.3
0.2	32.7
0.3	33.1

C₁₄H₁₆NO₃*p*-Toluidine salicylate (224, 228)

0.1	33.0
0.2	33.3
0.3	33.6
0.4	33.9

C₁₉H₁₆ (151)

Triphenylmethane

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	33
0.2	33
0.3	33

C₃₂H₆₄O₂ (81)

Cetyl palmitate

0.1	37.0
0.2	41.7
0.3	46.6
0.4	50.1
0.5	56.0

C₆H₁₄

Hexane

 $T_B = 342.1$ $k_B = 34$ **C₆H₅NO₂ (69)**

Nitrobenzene

1.0	28
2.0	23
3.0	20
4.0	18
5.0	17
6.0	15
7.0	15
8.0	14
9.0	14
10.0	14
15.0	13
20.0	17

C₆H₁₅NDi-*n*-propylamine $T_B = 383.8$ $k_B = 45.5^*$

* No experimental data given (56).

C₇H₅N

Benzonitrile

 $T_B = 463.8$ $k_B = 33.3$ **C₁₂H₁₁N (238)**

Diphenylamine

0.04	34.3
0.05	34.7
0.07	35.3

HgCl₂ (238)

0.05	31.2
0.1	34.0
0.15	39.2

HgI₂ (238)

0.015	37.3
0.05	31.1

AgNO₃ (123, 238)

0.05	33
0.1	34
0.2	34

C₇H₈

Toluene

 $T_B = 383.6$ $k_B = 35$ **S₈ (4)**

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.05	38.4
0.1	37.1
0.2	35.2
0.3	33.4
0.4	31.6
0.5	29.8

C₃H₇NO₂ (201)

Urethane

0.2	13.6
0.4	13.7
0.6	13.9
0.8	14.1
1.0	14.3

C₇H₉N (201)*p*-Toluidine

0.1	31.8
0.2	32.0
0.3	32.3
0.4	32.5
0.5	32.7
0.6	32.9
0.7	33.2

C₁₀H₈ (61, 169, 201)

Naphthalene

0.1	35.0
0.2	35.5
0.3	35.9
0.4	36.4
0.5	36.8
0.6	37.3

C₁₀H₁₂O (171)

Methylchavicol

0.05	33.8
0.1	33.7
0.2	33.5
0.25	33.4

C₁₀H₁₂O (171)*p*-Anethole

0.05	36
0.1	35
0.2	35
0.3	34

C₁₀H₁₄O (171)*p*-Methoxypropylbenzene

0.05	34.2
0.1	33.5
0.15	33.4
0.2	33.6

C₁₀H₁₆O (61)

Camphor

0.1	32.5
0.2	32.6
0.3	32.7
0.4	32.8
0.5	32.9

C₁₂H₁₀ (201)

Acenaphthene

0.1	37.6
0.2	37.6
0.3	37.7
0.4	37.7
0.5	37.8
0.6	37.9

C₁₄H₁₀ (201)

Phenanthrene

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	36.8
0.2	36.4
0.3	36.1
0.4	35.8

C₁₄H₁₀O₂ (61)

Benzil

0.05	33.2
0.1	34.0
0.15	35.0
0.25	34.7

C₁₄H₁₂ (4)

Stilbene

0.05	36.6
0.1	36.5
0.2	36.3
0.3	36.1
0.4	35.8

C₇H₈O

Anisole

 $T_B = 428.9$ $k_B = 40$ **C₈H₉NO (169)**

Acetanilide

0.1	36.7
0.2	34.5

C₁₄H₁₀ (112, 169)

Anthracene

0.1 | 37.1

C₁₉H₁₆ (169)

Triphenylmethane

0.05	41.8
0.1	42.1

C₇H₉N*p*-Toluidine $T_B = 473.6$ $k_B = 37.9$ **C₁₂H₁₁N (35)**

Diphenylamine

0.05	38.3
0.1	38.7
0.2	39.5
0.3	40.2

C₁₄H₁₀O₂ (35)

Benzil

0.05	38
0.1	38
0.15	39

C₁₆H₁₀N₂O₂ (35)

Indigotin

0.01	37
0.03	38

C₇H₁₄O₂

Isoamyl acetate

 $T_B = 415.6$ $k_B = 37.2$ **C₇H₆O₂ (34)**

Benzoic acid

0.2	34.6
0.5	34.2
1.0	33.5

C₁₂H₁₁N (34)

Diphenylamine

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.1	37.2
0.2	37.2
0.3	37.2
0.5	38
0.8	38

C₁₃H₁₀O (34)

Benzophenone

0.1	37.0
0.2	36.7
0.4	36.1
0.6	35.5

C₁₄H₈O₄ (34)

Alizarin

0.07 | 36.0

C₁₄H₁₀O₂ (34)

Benzil

0.1	36.6
0.2	36.1
0.3	35.7
0.5	34.9
0.7	34.2

C₈H₁₀*m*-Xylene $T_B = 412.1$ $k_B = 43$ **S₈ (4)**

0.02	42.6
0.05	41.7
0.1	40.3
0.2	37.4
0.27	36.0
0.35	35.0

C₈H₁₀*p*-Xylene $T_B = 410.8$ $k_B = 39.8$ **C₁₄H₁₀O₂ (61)**

Benzil

0.05	39.5
0.1	39.2
0.2	38.5
0.25	38.2

C₈H₁₀O

Phenetole

 $T_B = 445$ $k_B = 40.5$ **S₈ (170)**

0.02	39.7
0.06	38.3
0.1	37.3
0.14	36.7
0.18	36.3
0.22	35.9

C₁₄H₁₀ (169)

Anthracene

0.03	40.4
0.05	40.9
0.08	41.5

C₁₉H₁₆ (169)

Triphenylmethane

C₁₉H₁₆—(Cont'd)

<i>N</i>	$\frac{\Delta t_B}{x_1}$
0.03	40.4
0.05	40.4
0.08	40.3
0.1	40.3
0.12	40.2

C₉H₇N

Quinoline

 $T_B = 510.8$ $k_B = 43$ **C₁₄H₈O₂ (193)**

Anthraquinone

0.05	45.6
0.1	45.8
0.2	46.2

C₁₄H₈O₂ (193)

Phenanthraquinone

ZnBr ₂ (28)		S ₈ (4, 170)		C ₁₂ H ₉ N.—(Cont'd)		C ₁₀ H ₂₀ O		Na ₂ * (48)		S ₈ (37)	
N	$\frac{\Delta t_B}{x_1}$	N	$\frac{\Delta t_B}{x_1}$	N	$\frac{\Delta t_B}{x_1}$	Menthol		N	$\frac{\Delta t_B}{x_1}$	N	$\frac{\Delta t_B}{x_1}$
0.05	44.8	0.05	46.5	0.07	42.9	$T_B = 485$		0.1	41	0.05	37.4
0.1	44.7	0.1	46.2	0.15	42.3	$k_B = 41$		0.2	42	0.1	39.5
0.15	44.6	0.2	45.5	0.2	41.9			0.3	44	0.18	42.7
0.2	44.5	0.3	44.9					0.4	46		
ZnI ₂ (28)		C ₁₉ H ₁₆ (169)		C ₁₄ H ₈ O ₂ (181)		C ₁₂ H ₁₀ O ₂ S (48)		* Reacts with solvent to give a solute containing two atoms of Na per mole.		C ₁₄ H ₁₀ O ₂ (37)	
0.02	43.4	Triphenylmethane		Anthraquinone		Phenylsulfone				Benzol	
0.04	43.1	0.06	50.4	0.05	40.3	N	$\frac{\Delta t_B}{x_1}$			0.03	38.9
0.06	42.9	0.08	49.7	0.1	40.2	0.05	39.5 (Av.)			0.05	38.9
0.08	42.6	0.1	49.1	0.2	39.5	0.35				0.1	38.9
CdCl ₂ (28)		C ₂₁ H ₁₆ N ₂ (45)		C ₁₄ H ₁₀ (181)		C ₂₁ H ₁₆ N ₂ (48)		C ₁₂ H ₁₀		C ₂₁ H ₁₆ N ₂ (45)	
0.1	43.1	Lophine		Anthracene		Lophine		Diphenyl		Lophine	
0.2	43.9	0.02	46.0	0.07	40.4	0.05	41.6 (Av.)	$T_B = 528.0$		0.02	45.1
0.3	44.5	0.04	45.7	0.15	40.4	0.25		$k_B = 44.2$		0.05	46.3
0.4	45.0	0.06	45.4	0.2	40.4					0.1	48.2
0.5	45.5	0.08	45.3								
0.7	46.4	0.1	45.3								
CdBr ₂ (28)		C ₁₀ H ₁₂		C ₁₄ H ₁₀ O ₂ (181)		THREE-COMPONENT SYSTEMS					
0.1	43.9	1, 2, 3, 4-Tetrahydronaphthalene		Benzil		The A-component (the "solvent") is H ₂ O. (Standard arrangement.)		$T_B = 373.1; k_B = 28.9$			
0.2	44.3	$T_B = 480.3$		0.04	40.7	B = NH ₄ Cl		ΣN	$\frac{\Delta t_B}{\Sigma x}$	B = CdSO ₄	
0.3	44.8	$k_B = 43.3$		0.07	40.7	C = (NH ₄) ₂ SO ₄ (68)		$N_B/N_C = 0.5$		C = NaCl* (91)	
0.4	45.2	C₁₄H₁₀ (102)		0.1	40.7	C = CdCl ₂ * (62)		1.5	65.1	C = KCl* (62)	
CdI ₂ (28)		Anthracene				C = Hg(CN) ₂ * (63)		1.7	64.2	B = HgCl ₂	
0.05	43.4	0.1	43.5	HgCl₂ (181)		C = NaCl (68)		2.0	64.3	C = CuCl ₂ * (53)	
0.1	44.0	0.2	43.7	0.03	39.8	ΣN	$\frac{\Delta t_B}{\Sigma x}$	3.0	65.8	N_C/N_B	
0.2	45.0	0.3	43.9	0.06	39.8	$N_C/N_B = 1.0$		4.0	68.2	$N_B = 0.183$	
0.3	45.8			0.08	39.0	5.0	62.6	4.5	69.5	$N_C = 0.215$	
0.37	46.3			0.18	39.2	6.0	65.5	$N_B/N_C = 0.8$		0	32.6
CuCl (28)		C₁₀H₁₄		HgI₂ (181)		7.0	68.3	1.6	62.3	1.18	29.2
0.05	43.5	<i>p</i> -Cymene		0.02	39.3	8.0	70.4	1.8	61.1	∞	49.1
0.1	40.6	$T_B = 449$		0.06	39.3	9.0	72.4	2.0	61.2	C = CoCl ₂ * (53)	
0.2	36.6	$k_B = 40.0$		0.08	39.4	10.0	74.3	3.0	61.9	$N_B, N_C = 0.165$	
0.3	34.0	C₁₂H₁₁N (61)		0.1	39.4			4.0	64.2	0	33.3
0.4	32.3	Diphenylamine				B = (NH ₄) ₂ SO ₄		$N_C/N_B = 0.333, 0.5$		1.0	37.2
0.5	31.1	C₁₄H₁₀O₂ (34)				C = K ₂ SO ₄ (68)		1.0	55.8	∞	69.1
0.6	30.3	Benzil				$N_B/N_C = 1.0$		1.5	53.0	B = Hg(CN) ₂	
0.8	29.7	0.1 40.3				1.4	53.7	2.0	50.1	C = MgCl ₂ * (63)	
CoCl ₂ (28)		0.2 40.3				2.0	54.2	2.0	50.1	C = BaCl ₂ * (63)	
0.03	52.7	0.3 40.3				2.6	54.7	2.5	49.1	C = NaCl* (63)	
0.06	49.1	C₁₀H₁₆O				$N_C/N_B = 1.67$		3.0	48.5	C = KCl* (63)	
0.1	46.4	Camphor				4.2	55.8	B = ZnCl₂		C = KBr* (63)	
0.2	43.7	$T_B = 482.2$ (48)				5.0	58.0	C = CoCl₂* (53)		C = KI* (63)	
0.3	43.0	C₁₀H₁₆O				6.0	60.8	N_C/N_B	$\frac{\Delta t_B}{\Sigma x}$		
0.4	42.8	Fenchone						$N_B, N_C = 0.165$			
CoBr ₂ (28)		$T_B = 468$						0	49.5	B = CuCl ₂	
0.05	41.2	$k_B = 40.4$						1.0	54.0	C = NaCl (53)	
0.1	41.5	S₈ (181)						∞	69.1	N_B/N_C	
0.2	42.1	0.02	38.6					$N_B = 0.215$		$N_C = 0.339$	
0.3	42.6	0.08	37.7					0	49.5	0	
NiCl ₂ (28)								∞		0.63	
0.05	43.2							∞		∞	
0.1	43.2							∞			
0.2	43.2							∞			
0.3	43.2							∞			
NiBr ₂ (28)								∞			
0.05	41.7							∞			
0.1	41.9							∞			
0.15	42.0							∞			
0.2	42.2							∞			
C ₁₀ H ₈								∞			
Naphthalene								∞			
$T_B = 491.0$								∞			
$k_B = 46.4$								∞			
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B = CoCl₂.—(Cont'd)C = MgCl₂ (53)

N_B/N_C	$\frac{\Delta t_B}{\Sigma x}$
$N_B = 0.205$	
$N_C = 0.240$	
0	74.9
0.85	74.9
∞	67.8

C = CaCl₂ (53)

$N_B = 0.205$	
$N_C = 0.176$	
0	43.3
1.17	57.8
∞	67.8

C = BaCl₂ (53)

$N_B = 0.205$	
$N_C = 0.100$	
0	57.3
2.05	65.2
∞	67.8

C = NaCl (53)

$N_B = 0.205$	
$N_C = 0.836$	
0	49.5
0.246	57.0
∞	67.8

B = CrO₃C = K₂O* (130)

Data for saturated solutions only

B = Sr(NO₃)₂C = Ba(NO₃)₂ (68)

ΣN	$\frac{\Delta t_B}{\Sigma x}$
$N_C/N_B = 0.264$	
2.0	69.9
2.5	69.2
$N_C/N_B = 0.5$	
1.0	65.0
2.0	65.0

B = BaCl₂C = Ba(NO₃)₂ (68)

$N_C/N_B = 0.25$	
1.0	71.6
2.0	77.9
2.5	81.1
3.0	82.7

C = Ba(NO₃)₂.—

(Continued)

ΣN	$\frac{\Delta t_B}{\Sigma x}$
$N_C/N_B = 0.4$	
1.5	71.9
2.0	74.8
2.5	77.5
3.0	79.1
3.5	79.8
4.0	80.0

B = Ba(NO₃)₂

C = NaCl (68)

$N_C/N_B = 2.0$	
2.0	58.8
3.0	60.9
4.0	62.9
$N_C/N_B = 4.0$	
4.0	65.5
5.0	68.3
6.0	71.1

B = NaCl

C = KCl (68)

$N_B/N_C = 0.25, 0.33,$	
0.5	
2.5	55.7
3.0	57.3
4.0	60.7
5.0	64.2
6.0	67.3
7.0	70.0
8.0	72.6
9.0	74.8

 $N_B/N_C = 0.67, 1.0$

0.4	54.7
0.6	53.2
0.8	52.4
1.0	52.1
1.5	53.7
2.0	55.6
3.0	59.0
4.0	62.4
5.0	65.8
6.0	69.1
7.0	72.4
8.0	76.0
9.0	79.5

C = KCl.—(Cont'd)

ΣN	$\frac{\Delta t_B}{\Sigma x}$
$N_B/N_C = 1.5, 2.0$	
2.5	57.5
3.0	59.5
4.0	63.4
5.0	67.5
6.0	71.5
7.0	75.3
8.0	77.4

 $N_B/N_C = 3.0, 4.0$

2.5	58.1
3.0	60.3
4.0	64.5
5.0	68.8
6.0	73.0
7.0	76.8
8.0	78.3

B = KCl

C = KClO₃ (68)

ΣN	$\frac{\Delta t_B}{\Sigma x}$
$N_B/N_C = 1.0$	
3.0	52.1
4.0	53.3
5.0	54.5
6.0	55.5
$N_B/N_C = 2.0$	
3.0	52.9
4.0	54.7
5.0	56.4
6.0	58.2
7.0	59.4
$N_B/N_C = 3.0$	
4.0	56.7
5.0	58.4
6.0	60.1
7.0	61.8
8.0	63.2
9.0	64.6

C = K₂SO₄ (68)

B = KI

C = CdI₂* (62) N_B/N_C | $\frac{\Delta t_B}{x_1}$

$N_C = 0.078$	
0	31.3
1.0	31.4
2.0	31.5
3.0	31.6

B = C₆H₅ClO₂S

Benzene sulfone chloride

C = Al₂Br₆* (129)

$N_C = 0.084$	
0	31.3
1.0	16.4
2.0	12.6
$N_B = 0.34$	
3.0	15.3
5.0	20.7
15.0	28.0
∞	31.8

B = C₆H₅NO₂

Nitrobenzene

C = Al₂Cl₆* (129)B = C₇H₅ClO

Benzoyl chloride

C = Al₂Br₆* (129)

$N_C = 0.084$	
0	31.4
1.0	16.2
2.0	10.7
2.8	14.4

B = C₁₃H₁₀O

Benzophenone

C = Al₂Br₆* (129)

$N_C = 0.051$	
0	30.3
1.0	15.5
2.5	14.6
3.5	18.6

CHCl₃ $T_B = 334.3$ $k_B = 32.0$ B = C₂HCl₃O₂

Trichloroacetic acid

C = C₈H₁₁N* (243)

Piperidine

B = C₄H₁₂CIN

Diethylammonium chloride

C = C₁₂H₂₈IN

Tetrapropylammonium iodide (212)

ΣN	$\frac{\Delta t_B}{\Sigma x}$
$N_B/N_C = 1.0$	
0.3	7.7
0.4	7.3
0.5	7.1
0.6	7.1

B = C₅H₁₁N

Piperidine

C = C₆H₃N₃O₇

Picric acid* (243)

B = C₈H₂₀BrN

Tetraethylammonium bromide

C = NiC₃₆H₆₆O₆

Ricinoleate (226)

ΣN	$\frac{\Delta t_B}{x_1}$
$N_C = 0.215$	
0.2	7.9
0.6	11.5

B = C₈H₂₀CIN

Tetraethylammonium chloride

C = NiC₃₆H₆₆O₆

Ricinoleate (226)

$N_C = 0.061$	
0.06	6.8
0.2	12.9

B = C₁₀H₈

Naphthalene

C = C₁₄H₁₀O₂

Benzil (126)

 $N_B = 0.148$

0.15 | 33.1

0.2 | 32.5

0.25 | 33.0

B = C₁₀H₁₆CIN

Diethylaniline

hydrochloride

C = C₁₀H₁₆IN

Diethylaniline

hydride (212)

 $N_B/N_C = 2.0$

0.4 | 16.6

0.6 | 17.4

B = C₁₀H₁₆O

Camphor

C = C₁₄H₁₀O₂

Benzil (126)

 $N_C = 0.11$

0.1 | 28.7

0.15 | 30.5

0.2 | 32.3

B = C₁₀H₂₄CIN

Diamylammonium chloride

C = CuC₃₆H₆₆O₆

Ricinoleate (226)

 $N_C = 0.059$

0.06 | 12.8

0.2 | 18.8

0.3 | 20.2

0.4 | 21.6

B = C₁₂H₂₈IN

Tetrapropylammonium iodide

C = C₁₄H₁₀

Anthracene (212)

 $N_C/N_B = 1.0$

0.2 | 20.1

0.3 | 19.2

0.4 | 18.3

B = C₁₄H₁₀O₂

Benzil

C = C₁₉H₁₆

Triphenylmethane

(126)

ΣN	$\frac{\Delta t_B}{x_1}$
$N_C = 0.083$	
0.08	25.8
0.1	27.1
0.12	28.4

CH₄O

Methyl alcohol

 $T_B = 337.6$ $k_B = 26.8$ B = CH₃N₂O

Urea

C = C₇H₆O₂ (267)

Benzoic acid

C = C₇H₆O₃ (267)

Salicylic acid

C = C₁₀H₈ (267)

Naphthalene

C = C₁₀H₁₅BrO†

Bromocamphor

(267)

C = C₁₀H₁₆O (267)

Camphor

B = C₂H₅NO

Acetamide

C = C₁₀H₈ (267)

Naphthalene

B = C₃H₇NO₂

Urethane

C = C₁₀H₈ (267)

Naphthalene

B = C₇H₆O₂

Benzoic acid

C = C₇H₆O₃ (267)

Salicylic acid

C = C₁₀H₈ (267)

Naphthalene

C = C₁₀H₁₆O (267)

Camphor

B = C₇H₆O₃

Salicylic acid

C = C₁₀H₈ (267)

Naphthalene

C = C₁₀H₁₆O (267)

Camphor

B = C₈H₉NO

Acetanilide

C = C₁₀H₈ (267)

Naphthalene

B = C₁₀H₈

Naphthalene

C = C₁₀H₁₅BrO†

Bromocamphor

(267)

C = C₁₀H₁₆O (267)

Camphor

C = C₁₄H₁₀O₂ (267)

Benzil

The A-component (the "solvent") is an organic compound. The C-arrangement.

CCl₄ $T_B = 349.9$ $k_B = 31.4$ B = C₁₂H₂₄O₂

Lauric acid

C = C₁₆H₃₂O₂ (218)

Palmitic acid

CS₂ $T_B = 319.4$ $k_B = 31$ B = I₂C = S₈(82)

N_B/N_C	$\frac{\Delta t_B}{\Sigma x}$
$N_B = 0.045$	
0	31.9

N_B/N_C	$\frac{\Delta t_B}{\Sigma x}$
$N_B = 0.11$	
1.0	32.4
2.0	32.9
2.5	33.2

B = S₄ (7)C = S₈ (rhombic)

B = S ₈	
C = P ₄ (98)	
N _C = 0.26	
0	29.1
0.5	29.6
1.0	29.9
3.0	27.9

C₂H₅Br Ethyl bromide $T_B = 311.1$ $k_B = 29.4$
B = C ₇ H ₆ O ₂ Benzoic acid
C = C ₁₀ H ₁₅ BrO† Bromocamphor (267)
C = C ₈ H ₉ NO (267) Acetanilide
B = C ₈ H ₉ NO Acetanilide
C = C ₁₀ H ₁₅ BrO† Bromocamphor (267)
B = C ₁₀ H ₈ Naphthalene
C = C ₁₀ H ₁₅ BrO† Bromocamphor (267)

C₂H₆O Ethyl alcohol $T_B = 351.6$ $k_B = 26$
B = C ₇ H ₆ O ₂ Benzoic acid
C = C ₁₀ H ₈ (267) Naphthalene

B = C ₆ H ₁₁ N Piperidine
C = C ₇ H ₆ O ₂ * (243) Benzoic acid
C = C ₆ H ₃ N ₃ O ₇ * Picric acid (243)

B = C ₇ H ₆ O ₃ Salicylic acid
C = C ₁₀ H ₈ (267) Naphthalene

B = HgCl ₂ C = CoCl ₂ * (74)
N_B/N_C$ | \frac{\Delta t_B}{\Sigma x}$
$N_C = 0.035$
0 | 22.7
2.5 | 20.2
3.0 | 20.2
5.5 | 20.4
$N_B = 0.195$
1.0 | 15.9
2.0 | 18.3

B = CoCl ₂ C = CaCl ₂ (74)
$N_B = 0.067$
ΣN$ | \frac{\Delta t_B}{\Sigma x}$
0.05 | 22.9
0.1 | 22.9
0.2 | 23.1
B = NaC ₂ H ₅ O Ethylate
C = NaC ₆ H ₅ O ₃ Ethylacetacetate (269)
C = NaC ₇ H ₁₁ O ₄ Diethylmalonate (269)

B = KC ₇ H ₅ O ₃ Salicylate
C = C ₇ H ₆ O* (244) Salicylic acid

C₃H₆O Acetone $T_B = 329.2$ $k_B = 29.8$
B = C ₇ H ₆ O ₂ Benzoic acid
C = C ₁₀ H ₈ (267) Naphthalene

B = C ₁₀ H ₈ Naphthalene
C = C ₂₈ H ₅₆ O ₄ (268) Polyheptaldehyde

C₃H₇Br <i>n</i> -Propyl bromide $T_B = 344.0$ $k_B = 29.5$
B = C ₇ H ₆ O ₂ Benzoic acid
C = C ₈ H ₈ NO (267) Acetanilide
C = C ₁₀ H ₁₅ BrO† Bromocamphor (267)

B = C ₈ H ₈ NO Acetanilide
C = C ₁₀ H ₁₅ BrO† Bromocamphor (267)

C₃H₈O <i>n</i> -Propyl alcohol $T_B = 370.9$ $k_B = 27.0$
B = C ₇ H ₆ O ₂ Benzoic acid
C = C ₁₀ H ₈ (267) Naphthalene

C₄H₉Br Isobutyl bromide $T_B = 364.6$ $k_B = 27.0$
B = C ₇ H ₆ O ₂ Benzoic acid
C = C ₈ H ₈ NO (267) Acetanilide
C = C ₁₀ H ₁₅ BrO† Bromocamphor (267)
B = C ₈ H ₈ NO Acetanilide
C = C ₁₀ H ₈ (267) Naphthalene

C₄H₁₀O <i>tert</i> -Butyl alcohol $T_B = 355.9$ $k_B = 18$
B = CH ₄ N ₂ O Urea
C = CH ₄ N ₂ S Thiourea (8)
ΣN$ | \frac{\Delta t_B}{x_1}$
$N_C = 0.155$
0.155 | 18.8
0.2 | 20.1
0.3 | 21.7
0.4 | 22.4
0.5 | 22.7

C₄H₁₀O Ethyl ether $T_B = 307.6$ $k_B = 29.2$
B = C ₅ H ₁₁ N Piperidine
C = C ₇ H ₆ O ₂ * (243) Benzoic acid

C₅H₁₀O Diethyl ketone $T_B = 374.8$ $k_B = 32$
B = C ₁₀ H ₈ Naphthalene
C = C ₂₈ H ₅₆ O ₄ (268) Polyheptaldehyde

C₆H₆ Benzene $T_B = 353.35$ $k_B = 33.6$
B = C ₅ H ₁₁ N Piperidine
C = C ₇ H ₆ O ₂ * (243) Benzoic acid

* Indicates complex or compound formation.
† The isomer used is not given.

FOUR- AND FIVE-COMPONENT SYSTEMS

Solvent CH ₄ O	Solutes (8)	Solutes (8)
Methyl alcohol $T_B = 337.6$ $k_B = 26.8$	CH ₄ N ₂ O, Urea ($N = 0.345$) + CH ₄ N ₂ S, Thiourea ($N = 0.155$) + C ₁₈ H ₃₆ O ₂ , Stearic acid	CH ₄ N ₂ O, Urea ($N = 0.345$) + CH ₄ N ₂ S, Thiourea ($N = 0.155$) + C ₁₀ H ₈ , Naphthalene ($N = 0.146$) + C ₁₈ H ₃₆ O ₂ , Stearic acid ($N = 0.108$)
Solutes (267) C ₇ H ₆ O ₂ , Benzoic acid + C ₇ H ₆ O ₃ , Salicylic acid + C ₁₀ H ₈ , Naphthalene	ΣN$ | \frac{\Delta t_B}{\Sigma x}$	ΣN$ | \frac{\Delta t_B}{x_1}$
Solvent C ₄ H ₁₀ O <i>tert</i> -Butyl alcohol $T_B = 355.9$ $k_B = 18$	0.155 18.8	0.754 21.5
	0.5 22.0	
	0.6 22.9	

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P-T-X RELATIONS FOR SYSTEMS OF TWO OR MORE COMPONENTS AND CONTAINING TWO OR MORE PHASES (L-V, L_I-L_{II}-V AND S-L-V SYSTEMS)

F. C. KRACEK

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ABBREVIATIONS AND SYMBOLS	ABRÉVIATIONS ET SYMBOLES	ABKÜRZUNGEN UND ZEICHEN	ABBREVIAZIONI E SIMBOLI	
L (resp. L _I , L _{II}) Liquid phase.	L (resp. L _I , L _{II}) Phase liquide.	L (bezw. L _I , L _{II}) Flüssigkeitsphase.	L (oppure L _I , L _{II}) Fase liquida.	
S Solid phase.	S Phase solide.	S Bodenkörper.	S Fase solida.	
V Vapor phase.	V Phase vapeur.	V Dampfphase.	V Fase gassosa.	
M % Mole %.	M % Pourcentage moléculaire.	M % Mole %.	M % Percento molecolare.	
C g B/100 g H ₂ O.	C g de B/100 g H ₂ O.	C g B/100 g H ₂ O.	C g di B/100 g H ₂ O.	
crit. Critical point.	crit. Point critique.	crit. Kritischer Punkt.	crit. Punto critico.	
max. Maximum.	max. Maximum.	max. Maximum.	max. Massimo.	
x _B Mole fraction of B.	x _B Fraction moléculaire de B.	x _B Molenbruch B.	x _B Frazione molecolare di B.	
m Values in the metastable regions.	m Valeurs dans les régions métastables.	m Werte im metastabilen Gebiet.	m Valori nelle regioni metastabili.	
E Eutectic point.	E Point eutectique.	E Eutektischer Punkt.	E Punto eutettico.	
U Transformation temperature or incongruent melting point.	U Température de transformation ou point de fusion incongruent.	U Transformationstemperatur oder inkongruenter Schmelzpunkt.	U Temperatura di trasformazione oppure punto di fusione incongruente.	
† Saturated solution.	† Solution saturée.	† Gesättigte Lösung.	† Soluzione satura.	
Bold-face values indicate triple points.	Les chiffres en caractères gras sont des points triples.	Fettgedruckte Zahlen bedeuten Tripelpunkte.	I numeri scritti in nero indicano i punti tripli.	
The crystal phases (Bodenkörper) are indicated on the central line and apply to all the succeeding values until a new phase is indicated.	Les phases cristallines (Bodenkörper) sont indiquées sur la ligne centrale et se rapportent à toutes les valeurs successives, jusqu'à ce qu'une nouvelle phase soit indiquée.	Die Bodenkörper sind längst der Mitte angegeben und beziehen sich auf alle folgende Werte bis zur nächst angegebenen Phase.	Le composizioni delle fasi cristalline (Bodenkörper) sono riportate nella linea centrale, e ognuna si riferisce a tutti i valore che seguono fin dove si trova indicata una fase nuova.	

TWO-COMPONENT SYSTEMS—NON-AQUEOUS

Standard Arrangement, v. p. viii

A = Argon; B = O₂

t = 82.1°K (173)

M % A		p _{mm}		M % A		p _{mm}	
Liq.	Vap.	O ₂	A	Liq.	Vap.	O ₂	A
0	0	300	0	13.6	20.6	260.0	67.5
3.3	5.8	290.5	17	92.7*	97.8	9.0	411
5.6	9.2	283.5	28.5	100	100	0	411
10.2	16	269.8	51.4				

* Satd. soln., solid phase, Argon.

A = Argon; B = N₂ (168, 169); cf. (128)

See also p. 284, 309

85.11°K, Isotherm

Wt. % B		p _{mm}		Wt. % B		p _{mm}	
in system		B. P.*	Dew pt.†	in system		B. P.*	Dew pt.†
0		602.8	602.8	65.3		1379	
10.0		747.5		74.05			1242
24.3			731.8	82.6		1562	
31.5		1005		100		1743	1743
52.8			968				

* Vapor space estimated as less than 1/3 % of total volume.

† Estimated from p-v diagram.

Isobars

Wt. % B in system	p _{mm} = 500 | 760 | 1000 | 1500			
	B. P., °K			
0	83.45	87.26	89.93	94.18
10	81.42	85.25	87.98	92.32
31.5	78.65	82.40	85.06	89.29
65.3	75.86	79.41	81.95	85.97
82.6	74.82	78.30	80.76	84.70
99	73.94	77.35	79.78	83.64
100	73.87	77.28	79.71	83.57

Dew points, °K

24.3	81.79	85.46	88.04	92.15
52.8	79.41	82.97	85.40	89.33
74.05	77.22	80.66	83.08	86.93

A = O₂; B = N₂, see also Fig. 1 and p. 309 (219, 223, 297)

Critical region

M % A	t, °C	Liquid boundary		Vapor boundary	
		v, cm ³ /g	p _{atm.}	v, cm ³ /g	p _{atm.}
0	-147.13 crit.		33.49		
Air	-150.12		25.04		23.68
	-146.32	1.91	29.85		
	-144.35	1.98	32.5		
	-144.12		33.0		30.9

A = O₂; B = N₂, Critical region.—(Continued)

M % A	t, °C	Liquid boundary		Vapor boundary	
		v, cm ³ /g	p _{atm.}	v, cm ³ /g	p _{atm.}
Air	-143.35		34.0	5.32	32.0
	-143.14				32.3
	-142.35	2.17	35.3		33.5
	-142.0		35.7	4.61	34.1
	-141.35	2.28	36.5		35.3
	-141.0	2.63	36.9	3.95	36.1
	-140.9	2.67	37.1	3.82	36.4
	-140.8	2.76	37.2	3.78	36.6
	-140.73 crit.	2.86	37.25	3.64	36.9
	-140.63 max.			3.33	37.2
	-140.95	0.00203*	30.1	0.00986*	27.7
	-138.02	.00225	34.2	.00842	32.0
50.0	-135.95	.00245	37.4	.00735	35.0
	-134.50	.00266	39.5	.00645	37.6

M % A	t, °C	Liquid boundary		Vapor boundary	
		v, cm ³ /g	p _{atm.}	v, cm ³ /g	p _{atm.}
50.0	-133.00	0.00314	41.5	0.00514	40.5
	-132.66 crit.	.00358	41.9	.0046	41.3
	-132.64			.00366	41.9
	-132.64			.00455	41.5
	-132.61			.00373	41.95
	-132.61			.0044	41.6
	-132.53 max.			.00404	41.9
	-128	0.00244*	42.2	0.00609*	40.9
75.0	-125.95	.00287	45.5	.00474	44.7
	-125.75	.00307	45.7	.00448	45.1
	-125.65	.00321	45.8	.00433	45.35
	-125.60 crit.	.00336	45.9	.00419	45.5
	-125.53 max.			.00375	45.85
	-118.82 crit.		49.7		
100					

* Volume of system referred to 0°C and 1 atm. as unity.

Values of p in atm. and of Mol % O₂ in coexisting liquid and vapor phases; C = Mol % O₂ in vapor (66, 67, 173); cf. (40, 128, 389)

	t, °C	M % O ₂ in liquid											
		0	10	20	30	40	50	60	70	80	90	95	100
p.....	-198.68	0.702	0.6521	0.6015	0.5505	0.4994	0.4474	0.3937	0.3378	0.2775	0.2106		0.1380
C.....		0.0	2.68	5.48	8.54	12.04	16.26	21.65	29.02	40.06	58.98	74.79	100
p.....	-194.03	1.214	1.126	1.038	0.9535	0.8651	0.7777	0.6878	0.5934	0.4944	0.3868		0.2687
C.....		0.0	3.04	6.22	9.69	13.65	18.39	24.35	32.38	43.98	62.81	77.74	100.0
p.....	-182.63	3.689	3.439	3.186	2.931	2.674	2.414	2.152	1.886	1.613	1.331		1.033
C.....		0.0	3.86	7.98	12.50	17.61	23.60	30.90	40.18	52.69	70.80	83.44	100
p.....	-173.19	7.634	7.131	6.630	6.127	5.624	5.120	4.618	4.102	3.583	3.050		2.496
C.....		0.0	4.68	9.54	14.88	20.84	27.68	35.77	45.69	58.35	75.41	86.46	100
p.....	-163.08	14.58	13.62	12.68	11.76	10.86	9.96	9.066	8.172	7.271	6.357		5.415
C.....		0.0	5.64	11.48	17.54	24.17	31.55	40.02	50.09	62.47	78.40	88.30	100.0
p.....	-153.21	24.94	23.25	21.63	20.08	18.59	17.17	15.76	14.38	12.99	11.60		10.15
C.....		0.0	6.75	13.52	20.48	27.82	35.78	44.68	54.78	66.76	81.39	90.09	100
p.....	-148.13	31.94	29.75	27.69	25.73	23.88	22.10	20.35	18.65	16.95	15.24		13.47
C.....		0.0	7.53	14.85	22.20	29.81	37.91	46.79	56.81	68.47	82.49	90.71	100

A = O₂; B = CO₂, see also Fig. 2 (188, 189)

Critical region

M % A	t, °C	Liquid boundary		Vapor boundary	
		v*	p _{atm.}	v*	p _{atm.}
0	31.2 crit.		72.9		
10.53	17.6	0.00277	88.3	0.00796	66.2
	20.3	.00312	88.3	.00683	72.0
	22.0 crit.	.00363	86.8	.00599	76.4
	22.7			.00345	85.5
	22.7			.00554	78.7
20.03	23.3 max.			.00469	82.8
	9.6	0.00296	102.7	0.00881	65.3
	11.4	.00318	100.9	.00807	69.4
	12.5 crit.	.00337	99.7	.00752	72.25
	14.0			.00369	97.6
	14.0			.00681	76.8
	15.4			.00413	94.9
100.0	15.4			.00602	82.1
	16.3 max.			.00498	89.2
	-118.82 crit.		49.7		

* v = Volume of system referred to 20° and 1 atm. as unity.

A = O₂; B = Cu (132, 164, 339, 393, 421)

$t, ^\circ\text{C}$	$\text{O}_2/2\text{Cu}$ in liq.*	p_{mm}	$t, ^\circ\text{C}$	$\text{O}_2/2\text{Cu}$ in liq.*	p_{mm}
Cu + L _I			Cu ₂ O + L _I		
1 083	0		1 064	0.01560	
1 082	0.00036		1 096	0.02098	
1 075	0.00516		1 119.2		0.028
1 069	0.00779		1 129	0.02817	
1 064	0.01516		1 050.4		0.035
			1 166	0.04037	
			1 184.6		0.041

* Mole ratio.

* Mole ratio.

$t, ^\circ\text{C}$	$\text{O}_2/2\text{Cu}$ in liq.*	p_{mm}	$t, ^\circ\text{C}$	$\text{O}_2/2\text{Cu}$ in liq.*	p_{mm}
$\text{Cu}_2\text{O} + \text{L}_\text{I} + \text{L}_{\text{II}}\ddagger$			$\text{Cu}_2\text{O} + \text{L}_{\text{II}}$		
1 195	0.0918		1 100.3		302
1 195	0.4695		1 096.5		314.5
$\text{Cu}_2\text{O} + \text{L}_{\text{II}}$			1 091.9		344.5
1 235	0.500	0.6	1 090.1		387.5
1 231.3	$\left\{ \begin{array}{l} 0.5162 \\ 0.5256 \end{array} \right\}$	0.95	1 088.5		353.5
1 230.1		1.03	1 085.5		393
1 233.8		1.54	1 085.3		361
1 221.8		3.5	1 084.2		373.5
1 211.7		9.8	1 081.2	0.6369	
			$\text{Cu}_2\text{O} + \text{CuO} + \text{L}_{\text{II}}$		
1 206.0	0.5544		1 080.2E	(0.638)	402.5
1 201.8	0.5616		$\text{CuO} + \text{L}_{\text{II}}$		
1 200.8		16.5	1 083.8		450
1 196.9		22.2	1 088.7		512
1 185.4		33	1 089.5	0.6422	
1 183.0	0.5743		1 092.6		601
1 175.1		57.4	1 096.4		671
1 154.6		92.0	1 097.2		722
1 153.3		89.0	1 105.7		939
1 150.0		115.5	1 107.8	0.6715	
1 150.0	0.599	107	1 119.0		1 258
1 144.7		127.0	1 120.0	0.675	1 320
1 139.9		167.7	1 120.5	0.678	
1 134.8		157.1	1 130.0		1 716
1 131.3		219.7	1 135.8		2 020
1 123.0		205.5	1 150.0	0.699	3 280
1 120.0	0.617	220	1 160.0	0.7245	
1 109.2		257	1 171.0		6 700
1 109.0	0.6271		1 193.0	0.7345	

* Mole ratio.

* Mole ratio.

* Mole ratio.

A = O₂; B = Cu.—(Continued)

<i>t</i> , °C	O ₂ /2Cu in liq.*	<i>p</i> _{mm}	<i>t</i> , °C	O ₂ /2Cu in liq.*	<i>p</i> _{mm}
CuO + L _{II}			Unsaturated solutions		
1 204.4		16 090	1 080.7	0.638	406.5
1 210.6		24 150	1 081.5	0.638	412
1 216.5	0.7585		1 085.0	0.638	435
1 225.0	0.7705		1 120	0.649	482
1 232.5		44 700	1 150	0.635	389
* Mole ratio.			1 150	0.651	832
† The composition of the immiscible			1 150	0.678	1 497
liquids changes but slightly with tem-					
perature, the change being in direc-					
tion toward increased mutual solu-					
bility as temp. increases. Two liquid					
layers persist above 1400°.					

A = H₂; B = CO₂ (445): Critical region

Vol. % B	<i>t</i> , °C	Liquid boundary		Vapor boundary	
		<i>v</i> *	<i>p</i> _{atm.}	<i>v</i> *	<i>p</i> _{atm.}
4.99	15.3	0.00253	102.9	0.01105	57.2
	21.5	.00288	100.0	.00851	67.9
	26.8	.00381	93.2	.00582	81.75
	27.1 crit.	.00404	91.85	.00560	83.0
	27.3			.00425	90.5
	27.3			.00537	84.6
	27.5 max.			.00478	87.4
10.06	16.9			0.00940	67.8
	22.8			.00686	83.2
	24.2 crit.	0.00372	114.3	.00623	87.9
	25.0			.00410	108.4
	25.0			.00563	92.9
	26.45 max.			.00468	101
20.1	15.35			0.00877	79.1
	20.9			.00632	101.5
	22.2			.00595	106.4
	22.8 max.			.00498	120
0.0	31.2 crit.		72.9		
100.0	-239.9 crit.		12.8		

* *v* = Fraction of normal volume (0°C, 1 atm.).A = Cl₂; B = I₂ (38, 324, 380, 431)

L + V, values of total vapor pressure, mm

Vapor composition					Liquid composition			
$t, ^\circ\text{C}$ \ M % B	46.5	49.8	50.3	52.7	$t, ^\circ\text{C}$ \ M % B	30	64	80
10		13		14	59.6	52.0		
20		25	24	22.5	56.7	51.8		
25	43.5			31	51.1	50.7		
27.5	51		36.5		50.0	49.0		47.9
30		45	42.5	40	45.4		31.2	
40		72			45.3	35.2		
50		119			44.2	29.8		
60		191			38.6		11.4	
70		299						
80.3		454						
90.4		660						
96.6		808						

Saturated solutions

<i>t</i> , °C	M % B L | Vap.	<i>p</i> _{mm}	<i>t</i> , °C	M % B L | Vap.	<i>p</i> _{mm}
Cl ₂ (crys.)			ICl ₃ (crys.)		
-102	0 | 0		100		11 710
+30	0.1		96	29.2	
42.5	0.7		95.4		8 140
60.5	1.0		90.4		5 190
75	2.1		89	33.1	
94	7.9		85.3		3 550
101	25.0	12 170	78.7		2 285

A = Cl₂; B = I₂: Saturated solutions.—(Continued)

<i>t</i> , °C	M % B L | Vap.	<i>p</i> _{mm}	<i>t</i> , °C	M % B L | Vap.	<i>p</i> _{mm}
ICl ₃ (Crys.)			α-ICl		
73.6	37.6 | 10.3		15	56.8 | 51.8	16.0
70.1		1 185	13.5		14.3
64.1		773	10	59.2	12
60	39.2 | 12.5	571	α-ICl + I ₂		
50		296	7.9E	60.3 | 52.1	11
40	42.2 | 19.2	147	2 I		
30	44.2 | 29.8	72	10	60.6	11.2
25		49.5	20	64.9	15.0
22.7	45.7 | 36.4	42	25		20
20m	46.1		30	67.1	25
ICl ₃ + α-ICl			40	68.9	43
22.4E	46 | 36.5	40.5	50	71.4	63
α-ICl			70	78.1	
25	47.4 | 40.8	41.5	100	90.9	>100
26		41	114.3	100.0 | 100	91
27.2	50.0 | 49.0	39	Iβ-Cl		
27.1		36	12.0m	47.6	
26		31	13.9m	50.0	
24		27	7.0m	54.3	
22.5		24.5	0.9m	58.1	
20	54.4	21.0			

A = Cl₂; B = COCl₂ (303)

Vapor pressures of 71.7 Wt. % B solution

<i>t</i> , °C	-15	-10	-5	0	+5	10	15	20	25	30	35	40
<i>p</i> _{atm.}	1	1.32	1.63	1.97	2.33	2.72	3.14	3.60	4.09	4.62	5.22	5.88

A = HCl; B = C₂H₆, Ethane (323)

Retrograde condensation of first kind takes place in region between critical point and point of max. temp. of each mixture. The form of the critical curve is analogous in all respects to that of system N₂O + C₂H₆ (see Fig. 9). The C₂H₆ employed showed a condensation range of 1.4 atm. at 21.4°C, owing to presence of unknown amount of impurities.

Critical region

M % A	<i>t</i> , °C	Liquid boundary		Vapor boundary	
		<i>v</i> *	<i>p</i> _{atm.}	<i>v</i> *	<i>p</i> _{atm.}
0	31.9 crit.	0.0065	48.9		
28.6	14.5	0.00345	44.5	0.0142	42.2
	21.3	.00385	51.1	.0112	49.0
	25.4	.00435	55.2	.0095	53.8
	27.4 { crit. max.	.0058	57	.0058	57
38.3	14.0	0.0033	45.5	0.0137	42.0
	21.3	.00355	53.1	.0106	51.6
	25.4	.0038	57.6	.0084	56.4
	27.3 { crit. max.	.0054	59.3	.0054	59.3
59.6	14.1	0.0028	46.9	0.0134	45.8
	21.2	.0031	54.0	.0107	53.4
	25.4	.0034	58.9	.0092	58.4
	30.2	.0042	65.1	.0062	64.8
	30.5 crit.	.0048	65.4		
	30.6 max.				65.3
86.8	13.7	0.0021	42.1	0.0173	40.4
	21.3	.0023	50.0	.0139	47.8
	25.4	.0024	54.4	.0123	52.7
	30.2	.0025	59.9	.0109	58.2
	41.5	.0031	75.3	.0072	74.2
	43.1 crit.	.0042	77.5		
	43.3 max.				77.3
100	51.3 crit.	0.0039	81.6		

* *v* = Volume referred to volume at 0° and 1 atm. as unity.

A = HCl; B = C₂H₆O, Methyl ether, critical phenomena (215)

A = HCl; B = C₆H₇N, Aniline

For vapor pressure of solutions saturated with the compound, AB(131 to 190°), *v.* (37, 232). For L-V isotherm 200°, *v.* (37).

A = Br₂; B = I₂ (38, 210, 438)

t , °C	Atomic % B		p_{mm}	t , °C	Atomic % B		p_{mm}
	L	V			L	V	
Unsaturated solutions				151	70	48.5	770.1
50.2	25		331	159.4	80	50.3	757.8
	40		192	173.5	90	65.2	760.5
	50	8.2	86	187.5	100	100	771.7
	58	37.9	46	Solid solutions satd. with Br ₂			
	100	100	3.5	19	32.5		83
92.8	50		372	23	35.9		85.8
	60	18.8	206.7	25	35.9		85
	70	27.7	160.5	31	43.6		79.5
	80	35.7	113	36	47.1		64.1
	100	100	30.7	40.4	50		48.2
58.7	0	0	771.2	Solid solutions satd. with I ₂			
61.2	5		771.2	40.4	50.5		48.2
72.7	20	2.08	759.3	42	51.4		45.4
104.3	47.2	8.25	756.3	44.3	54.7		42.7
126	52	27.1	750	47.9	60.4		54.6
134.9	55		772.6	50	60.4		56.7
145.4	60	42.9	768.8	100	92.9		>200

A = HBr; B₁ = SO₂; B₂ = H₂S

L + V, 0 to 100 % B, -30 to -80°C (426)

A = I₂; B₁ = S; B₂ = Se; B₃ = Te (175, 459)

A = HI; B = H₂S

L + V, 0 to 100 % B, -30 to -80°C (426)

A = SO₂; B = CO₂, see also Fig. 3 and p. 285 (61, 85, 87, 88, 89, 90, 91)
L + V, critical region

Wt. % A	<i>t</i> , °C	Liquid boundary		Vapor boundary	
		<i>v</i> , cm ³ /g	<i>p</i> _{atm.}	<i>v</i> , cm ³ /g	<i>p</i> _{atm.}
0	31.2 crit.	2.24	72.9	2.24	72.9
10.35	26	1.621	61.4	8.658	45.2
	32	1.881	69.4	7.09	54.2
	37	2.055	74.6	5.357	63.5
	39 crit.	2.224	75.8	4.748	69.4
	40.4 max.				73.5
15.7	22	1.491	50.9	14.91	28.7
	27	1.506	56.3	12.53	33.6
	36.4	1.714	67	8.768	45.7
	46	1.963	76.5	5.988	60.4
	48.3 crit.	2.232	79.6	5.283	65.6
	49.8			5.034	67.4
	49.8			2.461	80.7
	52.1 max.				77
33.2	33.2	1.356	56.6	23.38	20.9
	44.5	1.455	69.5	14.21	31.2
	54.4	1.613	77.8	10.19	41.6
	65.3	1.982	87.8	7.023	56.4
	68 crit.	2.247	88.6	6.167	61.9
	70			5.738	66.2
	70			2.377	90
	72			5.244	70
	72			2.509	89.8
	74.2			4.420	78.2
	74.2			3.003	88
	75 max.				84
47.1	46.2	1.314	59.6	20.32	21.8
	56.8	1.495	68.9	14.09	30.2
	70.4	1.604	82.2	9.964	41.6

Wt. % A	<i>t</i> , °C	Liquid boundary		Vapor boundary	
		<i>v</i> , cm ³ /g	<i>p</i> _{atm.}	<i>v</i> , cm ³ /g	<i>p</i> _{atm.}
47.1	78.4	1.774	89.5	7.720	49.6
	83	2.002	92	6.851	57.2
	86 crit.	2.319	93	5.910	63.5
	88			5.530	68.4
	88			2.291	93.4
	89.6			4.897	71.8
	89.6			2.400	93.2
	91.4			4.500	75.1
	91.4			2.581	92.1
	93.4 max.				86
60.0	66.4	1.367	68.1	15.25	28.4
	70.8	1.402	70.0	13.68	30.8
	76.0	1.453	76	11.53	35.8
	81.0	1.510	81.4	10.11	40.5
	92	1.653	88.6	7.40	53.3
	98	1.831	92	6.114	61.4
	102	2.188	93.4	5.436	66.6
	106.5 crit.	2.509	94.2	4.794	73.6
	108.2			4.115	79.5
	108.2			2.688	93.1
	110			3.545	85.8
	110			3.188	89.6
	110.3 max.				87.5
70.9	61.5	1.232	55.6	21.59	20.4
	72.5	1.287	61.8	16.21	26.4
	81.4	1.311	68.6	12.71	32.4
	92.0	1.372	77.0	10.14	39.4
	102.8	1.511	84.0	7.514	51.2
	113.0	1.762	89.8	5.726	62.8
	119.5 crit.	2.489	90.8	4.331	73.4
	120.6			3.885	79.2
	120.6			2.553	90.4
	122.5 max.				85.5
81.4	71	1.123	48.8	19.10	21.4
	80	1.221	54.5	15.30	25.5
	94	1.319	63.2	10.85	34.6
	104	1.385	70.2	8.88	42.0
	114	1.418	77.4	7.05	51.2
	124	1.68	84.8	5.348	62.8
	132 crit.	2.204	86.6	3.907	75.8
	133.6			3.579	79.4
	133.6			2.466	86.0
	134.6 max.				84
91.1	81	1.125	40.4	18.40	21.4
	92	1.178	46.5	13.73	27.7
	102	1.216	52.2	10.98	33.8
	123.5	1.365	69.0	6.81	50.8
	133	1.483	75.2	4.94	62.3
	143	2.166	80.6	3.715	74.5
	145.4 crit.	2.192	81.4	3.20	78.0
	146.2 max.				80.4
100.0	157.2 crit.	2.07	78.2	2.07	78.2

A = SO₂; B = C₂H₆, Ethane, see Figs. 4 and 5 (282)

A = SO₂; B = CH₃Cl, Methyl chloride, see also Fig. 6 (86, 88, 89, 91, 92, 216)

Critical region

Vol. % A	<i>t</i> , °C	Liquid boundary		Vapor boundary	
		<i>v</i> , cm ³ /g	<i>p</i> _{atm.}	<i>v</i> , cm ³ /g	<i>p</i> _{atm.}
0	141.5		73.0		
25.0	100	1.562	33.0	12.42	31.3
	123	1.762	48.1	7.87	46.3
	127	1.808	51.6	7.17	49.0

A = SO₂; B = CH₃Cl: Critical region.—(Continued)

Vol. % A	t, °C	Liquid boundary		Vapor boundary	
		v, cm ³ /g	p _{atm.}	v, cm ³ /g	p _{atm.}
25.0	129	1.844	51.8	7.03	50.4
	136.8	1.950	59.0	5.48	57.8
	137.3	2.091	60.8	5.264	58.3
	141.5	2.232	64.5	4.206	61.4
	144.5 crit.	2.443	66.2	3.854	64.5
	145.8 max.			66	
37.5	123	1.682	49	8.29	45.2
	135	1.760	58	5.87	54.8
	140	1.903	63.4	5.12	60.8
	145.5 max.			2.26	67.0
50.0	95.0	1.381	30.8	14.62	26.8
	110	1.468	39.4	10.72	36.0
	123.6	1.556	48.5	7.71	46.3
	132*	1.676	55.6	5.71	55.6
	138.8	1.820	61.2	5.25	59.6
	141	1.995	62.8	4.95	60.9
	144.4	2.054	66.4	4.66	64.0
	146 crit.	2.083	67.4	4.19	64.6
	147.2 max.				66.5
62.5	115.5	1.381	40.6	9.00	38.2
	128	1.481	48.5	6.93	47.4
	137.5	1.615	56.2	5.66	54.8
	145	1.782	63.2	4.52	62.2
	150 crit.	1.982	69.4	3.52	68.0
75.0	109	1.277	38.5	10.77	35.2
	122	1.332	45.4	7.73	44.5
	137	1.471	55.8	5.65	55
	143*	1.582	61.3	4.51	61.3
	146.5	1.692	66.2	3.71	65
	151	1.969	70.6	3.44	69
	152 crit.	2.025	71.4	3.41	70.2
	153 max.				71.4
87.5	112.4	1.296	40.3	9.14	36.5
	132	1.390	54	6.13	50.6
	144.5	1.547	64.7	4.62	61.4
	148	1.610	67.2	4.08	65.8
94.5	155.5 { crit. max.	2.49	74.2	2.49	74.2
	123	1.274	47.8	7.60	44.8
	136	1.375	58	5.57	55.2
	149	1.579	69.5	3.94	68.2
	152	1.680	71.8	3.28	70.8
100	155.8 crit.	2.16	78.4		
	157.2		78.2		

* Azeotropic indifferent point.

A = SO₂; B = Cu, System, L + V (387, 432)A = H₂S; B = NH₃ (259, 349, 350, 353, 451)

t, °C	M % NH ₃	p _{atm.}	t, °C	M % NH ₃	p _{atm.}
NH ₄ HS + L _I + V			NH ₄ HS + L _{II} + V		
75.4	1.8		14.8		2.9
86.2	3.4*		<20.0	72.7	
87.7	3.8*		25		3.7
88.4	4.3		30		3.3
94.2		80.6	31.4		3.4
94.4	5.7		31.6		3.45
97.4	6.3*		31.7		3.5
101.1		89.7	35.7		4.6
102.4		91.9	39.6		4.3
103.0†		93.9	39.7		4.4
			41.2	70.9	4.6
			41.4		4.6

A = H₂S; B = NH₃—(Continued)

t, °C	M % NH ₃	p _{atm.}	t, °C	M % NH ₃	p _{atm.}
NH ₄ HS + L _{II} + V					
41.5		4.6	87.7		18.3
45.6		5.5	87.8		18.4
50.3		5.9	89.0		19.3
50.5		5.9	92.5		23
55		7.0	96		27
59.9		7.7	100		34
61.1		8.0	105		45
63.1		8.4	106.7		52
64.8		8.8	108.3	58.6	58
65		9	110.3		72
65.1		8.9	112.4		90
70.3		10.3	113.6		98
70.6		10.4	115.6		127
75		12	115.7	52.3	
77.8	66.7		116.5		172
79.4		13.7			
85		17			
85.7	65.6				

* These points lie near the three-phase line in L_I-V region.
† First critical endpoint.A = H₂SO₄; B = NH₃

For diagrams and tables of melting and boiling points, v. (177).

A = N₂O₃; B = N₂O₄ (256)Values of p_{mm}

Wt. % A	0	20	40	60	80	100
t, °C						
-24	70	110	170	268	460	865
-16	108	168	260	499	685	1250
-8	172	262	398	623	1018	1785
0	266	400	600	925	1475	2480
+8	396	590	882	1331	2075	3360
16	598	860	1270	1857	2825	4430
20	684	1040	1520	2130	3260	5000

A = N₂O; B = CO₂, see also Figs. 7 and 8 (88, 93)

Critical region

Wt. % A	t, °C	Liquid boundary		Vapor boundary	
		v, cm ³ /g	p _{atm.}	v, cm ³ /g	p _{atm.}
0.0	31.2 crit.	2.24	72.9		
2.20	15.3	1.603	54.5	6.689	53.2
	19	1.658	58.7	5.933	57.9
	23.2*	1.712	64.1	5.055	64.1
	27.4	1.921	70.3	4.055	70.1
	30.8 crit.	2.33	74.3		74.1
	30.9 max.				74.2
4.08	16.5	1.553	55.6	6.458	54.7
	20.2	1.628	60.1	5.703	59.6
	23.3	1.704	64.3	5.024	63.6
	26.5*	1.817	68.7	4.232	68.7
	28.4	1.93	71.7	3.892	71.5
	30.7 crit.	2.356	74.5	3.213	74.3
	30.8 max.				74.4
7.42	16.2	1.591	54.9	6.60	53.8
	18.6	1.637	57.6	6.00	56.6
	21.4	1.684	61.6	5.53	60.8
	23	1.73	63.6	5.16	62.8
	26.6	1.823	69	4.42	68.7
	29*	1.962	72.2	3.77	72.2
	30.7 crit.	2.387	74.7	3.22	74.5
	30.8 max.				74.6
21.3	13.6	1.587	51.5	7.66	50.6
	15.3	1.630	53.8	6.70	52.8
	18.3	1.674	57.2	6.17	56.2
	23	1.761	63.4	5.26	62.6

A = N₂O; B = CO₂: Critical region.—(Continued)

Wt. % A	t, °C	Liquid boundary		Vapor boundary	
		v, cm ³ /g	p _{atm.}	v, cm ³ /g	p _{atm.}
21.3	25	1.805	66.1	4.78	65.8
	26.4	1.875	68.1	4.51	67.8
	29	2.006	72.0	3.90	71.7
	31.2 { crit. max.	2.666	75.8	3.31	75.8
51.6	14.2	1.580	51.0	7.36	49.6
	17.1	1.595	54.3	6.70	53.1
	21.3	1.743	59.6	5.88	58.4
	24.2	1.773	64.0	5.22	62.8
	26	1.810	66.7	4.77	65.7
	28.4	1.869	69.9	4.33	69.0
	30.2	1.965	72.8	3.74	71.9
	32.2	2.135	75.7	3.11	75.0
	33 crit.	2.767	76.8		76.5
	33.1 max.				76.7
81.1	16.4	1.664	51.9	7.51	49.8
	18.8	1.711	54.4	6.94	52.5
	23.4	1.758	59.8	5.91	58.4
	26.4	1.805	64.1	5.15	63.0
	28.5	1.852	66.8	4.82	65.9
	30.8	1.947	69.8	4.30	69.2
	33.4	2.135	74.1	3.03	73.7
	34.4 crit.	2.89	75.8		75.5
	34.5 max.				75.6
91.9	16.5	1.578	51.0	7.56	48.9
	22	1.647	57.4	6.25	55.5
	25.1	1.667	61.0	5.72	59.2
	27.5	1.769	63.9	5.10	62.8
	30	1.884	67.1	4.64	65.9
	33.5	2.038	72.0	3.95	71.1
	35.2 crit.	2.268	74.5	3.34	73.6
	35.3 max.				74.3
100	36.0 crit.	2.39	71.9		

* Azeotropic indifferent point.

A = N₂O; B = C₂H₆, Ethane, see also Fig. 9 (212, 213, 214)
Critical region

Vol. % B	t, °C	Liquid boundary		Vapor boundary	
		v*	p _{atm.}	v*	p _{atm.}
0	36 crit.	0.0047	71.9		
18	2.85	0.00265	35.6	0.0205	35.3
	11.8	.0029	43.9	.0143	43.6
	19.1		51.8		51.5
	23	.0031	56.6	.0094	56.4
25	29.8 max.			.0052	65.3
	5.4	0.0027	38.1	0.0177	37.5
	13.2	.0029	45.6	.0131	45.1
	18.3	.0031	51.2	.0111	50.5
	22.2	.0032	55.6	.0094	55.1
	26.9	.0038	>61.4	.0066	<61.4
	27.6 crit.	.0043	>62.9	.0065	<62.9
	28.2 max.			.0046	63.4
43	9.8	0.0030		0.0150	40.6
	14.3		45.6	.0130	44.1
	20.5	.0035	52.3	.0096	51.8
	24.6	.0041	57.0	.0073	56.7
	26.05 { crit. max.		58.4		
	6.4	0.0036	36.9	0.0195	35.6
	11.35	.0038	41.1	.0164	40.0
	18.4	.0043	48.1	.0126	47
55	25.4		55.5	.0084	54.9
	26.05 { crit. max.	.0050 .0060			
			56.1	.0060	56.1

A = N₂O; B = C₂H₆, Ethane: Critical region.—(Continued)

Vol. % B	t, °C	Liquid boundary		Vapor boundary	
		v*	p _{atm.}	v*	p _{atm.}
76	5.25	0.0035	32.9	0.0217	31.3
	12.4	.0038	38.5	.0173	37
	18.4	.0041	44.0	.0140	42.2
	22	.0043	47.0	.0118	45.8
	26	.0048	51.1	.0092	50.3
	27.2	.0053	52.2	.0083	51.6
	27.9 { crit. max.	.0066	52.6	.0066	52.6
100	32 crit.	.0064	48.8		

* v = Volume referred to 0°C and 1 atm. as unity.

A = NH₃; B = (NH₂)₂ (136, 244)

t, °C	Wt. % B	p _{mm}
NH ₃		
-77.6	0	45.8
-78		44.5
-79	8.5	41.2
NH ₃ + (NH ₂) ₂		
-80E	13.0	38.0
(NH ₂) ₂		
-75	15.8	54
-70	19.5	76
-65	24.0	106
-60	28.9	146
-55	34.0	198
-50	39.5	253
-45	45.2	320
-40	51.1	397
-35	57.2	480
-30	63.3	562
-28	65.8	593
-26	68.3	617
-25	69.6	630
-24	70.8	641
-23	72.0	652
-22	73.3	661
-21	74.5	669
-20	75.7	676
-19	76.9	680
-18	78.1	683 max.
-17	79.3	683
-16	80.5	682
-15	81.6	679
-14	82.8	673
-13	84.0	665
-12	85.1	655
-11	86.2	640
-10	87.4	620
-8	89.6	575
-6	91.9	510
-4	94.0	420
-2	96.2	320
0	98.2	175
+1.8	100.0	3.2

A = NH₃; B = NH₄N₃ (75)

t, °C	Wt. % A	p _{mm}
NH ₄ N ₃ .2NH ₃		
-33	59.5	43.6
NH ₄ N ₃ (?)		
0	51	149.5

A = NH₃; B = NH₄NO₃
(130, 158, 190, 224)

Values of p _{mm}			
M % B	0°	10°	20°
0	3221	4612	6429
19	1507		
20	1398		
21	1298		
22	1209		
23	1126		
24	1047	1591	
25	975	1489	
26	910	1395	
27	850	1309	
28	793	1226	
29	741	1151	
30	694	1080	1581
31	650	1015	1492
32	610	952	1408
33	574	897	1331
34	540	844	1259
35	507	795	1190
36	467	749	1126
37	449	707	1067
38	424	668	1011
39	400	632	959
40	377.5	599	911
41	357	568	865
42		540	823
43		514	783
44			745
45			709

t, °C	p _{mm}	M % B
NH ₄ NO ₃		
0	353.8	41.1
10	510.5	43.1
20	706	45.1

A = NH₃; B = NH₄Br (24, 31)

t, °C	p _{mm}	C
NH ₄ Br.3NH ₃		
8.7m	1140	192
NH ₄ Br.NH ₃		
-10m	405	208
-5 m	512	212
0 m	635	215
+5 m	780	218
NH ₄ Br.NH ₃ + NH ₄ Br.3NH ₃		
6.5U	815	218.5
NH ₄ Br.NH ₃		
10	942	220
15	1130	226
20	1350	230
25	1590	235

A = NH_3 ; B = C_8H_{10} , *m*-Xylene
Values of p in atm. (99, 204, 329)

M % A	0	10	15	20	25	30	40	50
$t, ^\circ\text{C}$								
7.83	0.00303	2.05	2.96	3.64	4.17	4.56	5.07	5.38
9.82	0.00346	2.17	3.09	3.82	4.39	4.82	5.39	5.71
11.8	0.00397	2.24	3.20	3.99	4.60	5.07	5.70	6.06
13.8	0.00450	2.35	3.36	4.18	4.82	5.33	6.03	6.42
14.8	0.00480	2.40	3.43	4.29	4.96	5.49	6.17	6.58
16.8	0.00546	2.52	3.61	4.49	5.20	5.76	6.54	6.98
19.8	0.00663	2.66	3.82	4.79	5.57	6.19	7.08	7.61

M % A	60	70	80	90	92.5	95	97.5	100
$t, ^\circ\text{C}$								
7.83	5.50 (56.8-93.6 %)*					5.51	5.55	5.63
9.82	5.87 (60.4-92.2 %)*					5.89	5.94	6.03
11.8	6.23	6.26 (64.5-90.4 %)*		6.27	6.29	6.35	6.46	
13.8	6.62	6.68*†		6.69	6.71	6.74	6.79	6.90
14.8	6.80	6.90	6.92	6.93	6.94	6.97	7.02	7.14
16.8	7.23	7.34	7.38	7.39	7.39	7.42	7.49	7.62
19.8	7.91	8.05	8.10	8.12	8.14	8.18	8.26	8.43

* Region of two liquid phases.

† 71-87.5 %.

Three phase, $L_I + L_{II} + V$

$t, ^\circ\text{C}$	$p_{\text{atm.}}$	M % A	
		L_I	L_{II}
-33.5	1	10	99.5
-20	1.8		
-10	2.8		
0	4.35		
+8	5.53	57.0	93.5
0	5.90	60.8	92.1
2	6.32	65.3	90.1
14	6.75	72.5	86.7
14.5*	6.86	81	

* Critical solution point.

A = NH_3 ; B = $\text{C}_2\text{H}_4(\text{NH}_2.\text{HCl})_2$, Ethylenediamine hydrochloride (59)

A and B in equimolar proportions. The pressures correspond to $2\text{NH}_3 + \text{C}_2\text{H}_4(\text{NH}_2.\text{HCl})_2 \rightleftharpoons \text{C}_2\text{H}_4(\text{NH}_2)_2 + 2\text{NH}_4\text{Cl} + \text{satd. soln.} + V$

$t, ^\circ\text{C}$	-23	-9.2	0	+12.4	16.8
p_{mm}	78-85	90-100	120-160	336	431

A = NH_3 ; B = NH_4CNS (69, 100, 129, 130, 131)

Values of p_{mm}

M % B	0*	10°	20°	M % B	0°	10°	20°
0	3 221	4 612	6 429	30	301.5	500	793
15	1 530			31	273	452.5	728
16	1 386			32	247	410	669
17	1 257			33	224.5	372.5	613
18	1 133			34	204	342	562
19	1 021	1 530		35	186.0	315.5	516
20	919	1 389		36	170.2	290.5	474
21	826	1 259		37	156.4	260.5	435.5
22	743	1 139		38	144.0	240.5	401.5
23	662	1 030	1 503	39	132.9	222.5	369.5
24	578	931	1 367	40	123.5	206.5	341
25	524	840	1 246	41	114.7	192.1	315
26	467	758	1 136	42	106.9	179.7	291.5
27	417.5	684	1 039	43		168.3	270
28	374	616	948	44			250.5
29	334.5	555	867				

M % B	30°	40°	M % B	30°	40°	M % B	30°	40°
0	8 749	11 658	39	575		44	395.5	593
35	789		40	533	790	45	368.5	554
36	726		41	494	735	46	344.5	518
37	672		42	457.5	683	47	322.5	485
38	622		43	425.5	636	48		456

$t, ^\circ\text{C}$	p_{mm}	M % B	A = CO_2 ; B = CaO .—(Cont'd)		
	NH_4CNS		$t, ^\circ\text{C}$	p, mHg	Wt. % B*
0	105	42.3		CaCO_3	
10	165.2	43.3	1306.4	157.4	
20	235.3	44.9	1314.0	193.8	
30	322	47.0	1324.2	449.0	
40	407	49.8	1325.0	426.0	

* Free CaO .

A = COCl_2 , Phosgene; B = AlCl_3 (143)

Wt. % B	p_{mm}	
	0°	25°
0	555	1406
5	540	1372
10	525	1335
15	508	1293
20	490	1243
25	462	1180
30	430	1107
35	394	1015
40	354	897
45	308	748
50	260	551
55		328

A = COCl_2 , Phosgene; B = CaAl_2Cl_6 (144)

Wt. % B	p_{mm}	
	0°	25°
0	555	1405
5	551	1396
10	547	1387
15	542.5	1377
20	537.5	1364
25	529.5	1342
30	510.0	1301
35*	469.0	1212
$t, ^\circ\text{C}$	p_{mm}	Wt. % B
		$\text{CaAl}_2\text{Cl}_6.2\text{COCl}_2$ (?)
0	493	32.5
25	1240	33.5

* Supersatd. solutions.

A = COCl_2 , Phosgene; B = SrAl_2Cl_6 (142)
 $t = 25^\circ\text{C}$

Wt. % B	p_{mm}	Wt. % B	p_{mm}
0	1405	35	1350
5	1404	40	1287
10	1402	45	1185
15	1400	50	1140
20	1397	55*	867
25	1391	60*	664
30	1378		

* Supersatd. solutions.

A = NH_3 ; B = $\text{Hg}(\text{CN})_2$
 $t = 0^\circ\text{C}$ (71)

Wt. % NH_3	p_{mm}
20.72*	1067
20.93	1098
21.87	1200
22.36	1257
23.4	1362
24.33	1445
25.20	1536
26.10	1615
100.0	3221

* Satd. with $\text{Hg}(\text{CN})_2.2\text{NH}_3$.

A = NH_3 ; B = LiNO_3 (100)

Wt. % B	$t, ^\circ\text{C}$	p_{mm}
	L + V	
63.66	15.5	487.5
	22.4	627.4
	30.05	818.1
	35.0	998.2
	LiNO_3	
	-13.0	239.3
	-6.0	259.9
	+1.5	321.9
	8.5	382.9
63.66	9.5	392

A = NH_4Cl ; B = PbCl_2 , TiCl_4 , ZnCl_2 , CdCl_2 , CuCl , FeCl_3 or LiCl (153)

A = CO_2 ; B = CaO (62, 420)

$t, ^\circ\text{C}$	p, mHg	Wt. % B*
	CaCO_3	
1240	30.0	9.2
1244.5	31.5	
1244.9	31.5	
1267.2	39.7	
1270.1	39.5	
1275.6	53.5	
1278.1	49.9	
	76.0	7.6
	83.6	7.8
	104.1	6.2
	92.7	4.6
	106.4	5.0
1296.0	107.3	
1296.9	106.2	
1304.8	108.3	
	109.4	4.0

A = COCl₂; B = SrAl₂Cl₈.—
(Continued)

<i>t</i> , °C	<i>p</i> _{mm}	Wt. % B
25	950	52.3

A = COCl₂, Phosgene; B =
BaAl₂Cl₈ (142)

<i>t</i> , °C	<i>p</i> _{mm}	Wt. % B
25	1402	50(L _{II})
25	1340	55

A = COCl₂, Phosgene; B =
NaAlCl₄ (142)

Wt. % B	<i>p</i> _{mm}	Wt. % B	<i>p</i> _{mm}
0	1405	25	1379
5	1402	30	1354
10	1399	35	1308
15	1396	40*	1240
20	1391		

<i>t</i> , °C	<i>p</i> _{mm}	Wt. % B
25	1285	40

* Supersatd. solution.

For A = other C-compounds,
v. the C-Table.

A = CuS; B = CuSO₄ (363)

C-Table, The C-Arrangement

A = CCl₄, Carbon tetrachloride;
B = C₂H₆O, Ethyl alcohol
Values of *p*_{mm} (377); see also p. 312

Wt. % A	34.8°	50°	60°	66°
0	173	312	446	544
2.57	221	413	601	741
7.02	225	428	630	780
15.75	226	430	637	788
23.31	223	427	637	789
28.32	220	427	630	782
41.75	206	403	600	752
51.14	193	381	571	716
56.13	187	369	554	700
60.94	179	355	534	677
72.87	156	317	487	614
79.98	142	292	453	576
89.77	122	257	404	520
100.0	103	223	354	462

A = CO₂; B = CH₃Cl, Methyl
chloride (72, 84, 88, 89, 91, 160,
161, 211, 214); see also p. 286

This system resembles in all
particulars the system CO₂—SO₂
(Fig. 3) and like the latter is
characterized by very consider-
able pressure variation from
the dew-point curve to the

A = Fe₂O₃; B = FeCl₃ (48, 428,
429)

<i>t</i> ± 2°C	<i>p</i> _{atm.}	<i>t</i> ± 2°C	<i>p</i> _{atm.}
FeCl ₃ + FeOCl + V			
253	0.045	291	0.384
255	0.051	292	0.408
264	0.087	295	0.484
266	0.100	299	0.603
273	0.144	300	0.617
275	0.163	301	0.676
283	0.252		
FeOCl + L + V			
310	0.855	418	3.91
316	0.955	433	4.65
324	1.08	435	4.84
331	1.24	454	5.85
354	1.70	458	6.24
355	1.76	460	6.24
370	2.1	480	7.77
392	2.83	492	8.88
403	3.31	493	9.1
417	3.85		
FeOCl + Fe ₂ O ₃ + V			
436	1.42	466	3.02
439	1.66	472	3.63
443	1.73	475	3.80
444	1.83	483	4.57
456	2.32	488	5.24
458	2.56	502	7.08
465	3.03	504	7.33
<i>t</i> ± 2°C <i>p</i> _{atm.}			
FeCl ₃ + FeOCl + Fe ₂ O ₃ + V			
110	5 × 10 ⁻⁸		
FeCl ₃ + FeOCl (?) + L + V			
305	0.81		
FeOCl + Fe ₂ O ₃ + L + V			
525	11.7		

boiling-point curve within each
constant total composition con-
densation loop. The critical
points (crit.) and maximum tem-
peratures (max.) are as follows:

Vol.	<i>t</i> , °C	<i>p</i> _{atm.}
% B		L | V
0	31.2 crit.	72.9
10.4	43 crit.	75.4 | 68
	45 max.	74
20.2	55.5 crit.	78 | 62
	60 max.	75.5
32.2	70.7 crit.	80 | 62
	74.5 max.	77
40.4	80 crit.	84.5 | 63.5
	84 max.	77.5
50.3	92.5 crit.	85 | 71.5
	94.8 max.	79
61.8	102.3 crit.	85 | 69
	105 max.	80
70.2	115 crit.	80 | 67
	117.5 max.	76
80	124 crit.	75.5 | 67
	126 max.	74
89.9	131 crit.	72 | 67
	133 max.	71
100	141.5 crit.	73

A = CO₂; B = C₂H₂, Acetylene
Critical region (213, 214)

A = CO₂; B = C₂H₆, Ethane, see also Fig. 10 (213, 214, 221, 222)
Critical region

Vol.	<i>t</i> , °C	Liquid boundary		Vapor boundary	
% B		<i>v</i> *	<i>p</i> _{atm.}	<i>v</i> *	<i>p</i> _{atm.}
0	31.2 crit.	0.0044	72.9		
15	10.35	0.0028	49.45	0.0121	48.85
	16.0	.0030	56.32	.0098	55.72
	23.2 crit.	.0041	66.3	.0058	66.15
	23.35			.0046	66.52
	23.35			.0054	66.44
	23.4 max.			.0052	66.54
30	8.95	0.0031	49.07	0.0116	48.58
	14.95	.0035	56.28	.0087	55.82
	17.28	.0038	59.3	.0073	59.0
	18.68	.0045	61.2	.0058	61.1
	18.73	.0047	61.3	.0057	61.2
	18.8 { crit.			.0053	61.25
	max.				
43	8.95	0.0034	48.45	0.0116	47.3
	14.95	.0039	55.3	.0084	54.5
	17.56	.0049	58.42	.0063	58.18
	17.62 { crit.			.0058	58.37
	max.				
50	8.8	0.0035	47.5	0.0124	45.7
	9.1	.0035	47.7	.0122	45.95
	14.95	.0040	54.1	.0090	52.9
	17.55	.0049	57.2	.0068	56.6
	17.75	.0056	57.2	.0066	56.9
	17.85 crit.	.0061	57.15	.0065	57.0
	17.9 max.			.0063	57.1
100	32 crit.	0.0064	48.8		

* *v* = Volume referred to 0°C and 1 atm. as unity.

Solutions saturated with CO₂ (crys.)

<i>t</i> , °C	-80	-75	-70	-67	-65	-62.8
<i>p</i> _{atm.}	2.53	3.19	3.48	4.67	4.97	5.4
M % B				50		30

A = CO₂; B = C₃H₇NO₂,
Urethane (196, 197, 198)

L_I + L_{II} + V

Mixtures containing a suit-
able concentration of B (never
exceeding 4%) exhibit (partial)
liquid immiscibility up to the
critical region.

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
26.0	63.1	33	73.4
27	64.5	34	75.0
28	65.85	35	76.6
29	67.3	36	78.25
30	68.75	37	80.0
31	70.3	37.3*	80.5
32	71.8		

* At this point the L_I + L_{II} + V
curve intersects the critical curve of
the system; critical endpoint.

A = CO₂; B = C₄H₁₀O, Ethyl
ether (348, 441, 442)

L + V (critical phenomena)

Liquid		Vapor	
Wt. % A	<i>p</i> _{atm.}	Wt. % A	<i>p</i> _{atm.}
35°C			
14.6	7.7	82.9	6
25.9	15.5	88.7	9
36.6	27	91.1	23
46.6	43.6	93.8	31
50.2	48.4	95.9	57
54.2	58	97.9	60
59.2	70		
75*	74	75*	74
60°C			
14.6	15.5	82.9	9
25.8	23	88.7	15
32.8	48	91.1	46
37.6	58		
41.9	68		
44.4	77		
65*	85	65*	85

A = CO₂; B = C₄H₁₀O.—
(Continued)

Liquid		Vapor	
Wt. % A	<i>p</i> _{atm.}	Wt. % A	<i>p</i> _{atm.}
100°C			
15.1	58	69.4	22
22.0	67	82.9	48
27.1	77	88.7	58
31.2	87		
36.6	94		
50*	94	50	94

* Critical point.

A = CO₂; B = C₅H₁₂, Isopentane
Critical phenomena (445)

A = CO₂; B = C₆H₃N₃O₇, Picric
acid (139)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
B (crys.)			
22.85	59.7	31.9*	73.2
25.5	63.1	98.4	212.7
28.3	67.2	98.9	192.6
29.6	69.4	99.9	173.9
30.4	70.5	101.1	155.9
30.8	71.2	102.9	135.3
31.2	71.8	104.9	117.8
31.4	72.3	106.5	101.8
31.6	72.6	108.1	90.2
31.8	72.9	121.5†	

* First critical endpoint (pure CO₂ by same author 31.2°, 72.4 atm.); second critical endpoint unrealized.

† Triple point of B.

A = CO₂; B = C₆H₅NO₂, Nitrobenzene (198)

L_I + L_{II} + V, critical region
Two liquid phases exist in this system in the neighborhood of the critical point of A under conditions satisfying van der Waals' criteria for *double retrograde* condensation (van der Waals-Kohnstamm "Thermodynamik," Vol. 2, p. 382ff.). The phenomenon was not realized; approximate measurements are given for solutions up to 12.1 M % B. Between 9 and 12.1 M % B the three-phase (L_I + L_{II} + V) curve exhibits two critical points at ca. 29.9°, 67 atm. and 39.9°, 84 atm. respectively. The corresponding L_{II} + V curve is established roughly to 40°, 101 atm.

A = CO₂; B = C₆H₇N, Aniline (359)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
AB + L _I + V			
-0.6	33.3	12.8	46.5
+2.2	35.7	13.4	47.3
4.7	38.1	14.8	48.6
7.4	40.8	15.9	49.8
9.0	42.5	16.95	50.9
10.8	44.4	18	52

A = CO₂; B = C₆H₇N.—
(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
AB + L _{II} + V			
0	6	11.6	21.7
0.95	7.4	13.5	26.7
2	9	15.5	34.6
5	10.9	15.9	36.4
7	14	17.1	43.8
8.1	15	17.6	48.3
9.7	17.5	18	52
L _I + L _{II} + V			
Metastable		Stable	
8.7	41.8	19.7	54.1
9.85	42.8	20.7	55.4
10.0	43.2	21.5	56.3
10.9	43.9	25.15	61.1
11.5	44.8	26.3	62.7
11.85	45.1	30.25	68.4
13.25	46.6	33.9	74.0
13.95	47.4	35.8	77.1
16.0	49.7	37.15*	79.5
16.95	50.8		
17.8	51.8		
18	52		
AB + L _I + L _{II}			
18.0	52	18.2	80

* Critical solution point.

A = CO₂; B = C₇H₉N, Toluidines (359)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
<i>o</i> -Toluidine			
L _I + L _{II} + V			
-7.5*	27.5	15.6	49.0
-2.1	31.5	19.4	53.5
+0.3	33.6	20.4	54.8
3.9	36.8	24.7	60.1
7.3	40.1	29.6	67.1
9.5	42.3	34.5	74.9
11.8	44.7	38.1**	80.8
<i>m</i> -Toluidine			
AB + L _I + V			
-3.4	30.8	2.9	36.2
-0.2	33.4	4.7	37.7
+1.9	35.3	5.7	38.6
AB + L _{II} + V			
-2.6	10.4	2.9	23.1
+0.6	16.5	5.0	31.5
L _I + L _{II} + V			
7.5	40.5	23.9	59.5
10.0	43.1	27.35	64.2
13.2	46.4	30.3	68.5
15.5	49.2	33.7	73.8
18.0	52.1	35.85	77.4
20.9	55.7	37.2**	79.6
AB + L _I + L _{II} + V			
6.3	39.2		
<i>p</i> -Toluidine			
AB + L _I + V			
-0.4	33.9	23.3	59.8
+5.1	39.1	25.6	62.4
9.6	43.6	27.0	64.3
13.1	47.6	29.7	67.7
17.5	52.7	30.8	69.0
19.8	55.5	31.5†	70.0

A = CO₂; B = C₇H₉N.—
(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
AB + L _{II} + V			
29.7§	44	31.3	62.2
30.2	47.7	31.4	65.0
30.8	52.5	31.5†	70.0
31.1	57.3		
B + L _{II} + V			
29.7§	44	34.0	32.5
30.3	43	36.2	26.8
32.0	38.2	44	0.0013
L _I + L _{II} + V			
31.5†	70	35.05	75.7
32.8	72	37.75¶	80.4
33.9	73.9		

* Quadruple point.

** Critical solution point.

† AB + L_I + L_{II} + V.

§ AB + B + L_{II} + V.

|| B, triple point.

¶ L_I + L_{II} + V, critical point.

A = CO₂; B = C₁₀H₈, Naphthalene (139)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
C ₁₀ H ₈			
25.2	62.1	31.7	71.4
27.7	65.4	31.95	71.9
29.5	68.1	32.2	72.3
30.3	69.3	32.4	72.7
30.9	70.3	32.8	73.7
31.4	70.9	33.0	74.1

A = CS₂; B = CH₄O, Methyl alcohol (79, 345)

$t, ^\circ\text{C}$	M %		p_{mm}
	L_{I}	L_{II}	
$L_{\text{I}} + L_{\text{II}} + V$			
-15		81	<i>ca.</i> 70
0		76.8	154
+10	3.8	73.4	245
15	5.6	71.2	305
20	7.5	68.4	379
25	10.0	65.0	465
30	13.4	60.3	567
35	18.8	52.0	687
36	20.7	49	712
37	23.5	44	744
38	32	32	770

Isotherms—L + V

<i>t</i> , °C	M % B	0	4.7	72.2	90.3	100
-10		78.4			80.5	
-5		99.2			102	18.1
0		124.5			128	25.5
+5		156			160	35.5
10		193			199	48.9
15		237		303	246	65.8
20		290	373	375	303	88.5
25		353	458	460	371	117
30		424	557	561	451	152.2
35		510	676	680	545	198
40		609	813	819	656	254
45		723	976	979	785	322
50		857	1162	1168	935	406
55		1004	1375	1382	1108	506
60		1175			1305	627

A = CO₂; B = C₁₀H₈.—
(Continued)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
C ₁₀ H ₈			
33.2	74.4	59.9	116
33.3*	74.6	61.3	103.3
58.5	201.7	63.5	88.5
58.8	184.0	65.1	79.2
59.1	164.0	66.5	67.9
59.3	146.0	68.3	58.3
59.7	131	79.7†	0.0053

* First critical endpoint (pure CO₂, 31.2°, 72.4 atm., by same author); second critical endpoint unrealized.

† Triple point of B.

A = CHCl₃, Chloroform; B = C₆H₄N₂O₄, *m*-Dinitrobenzene (384.5, 423)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
<i>m</i> -C ₆ H ₄ N ₂ O ₄		
23.5	157	
25.0		40.9
25.5	169.4	
27.9	185.3	
30.0		49.3
30.3	201.0	
33.5	224.6	
35.4	239.1	
38.4	262.8	
40		72.5
41	284.1	

A = CS₂; B = CH₄O: Isotherms—L + V.—(Continued)

<i>t</i> , °C	M % B	11.7	19.4	26.4	30.7	52.9
30		563				
35		683				693
40		828	833	838	838	838
45		992	999	1002	1002	1002
50		1185	1193	1195	1195	1195
55		1405	1414	1416	1416	1416

A = CHCl₃, Chloroform; B = C₈H₉NO, Acetanilide (384.5, 423)

<i>t</i> , °C	<i>p</i> _{mm}	Wt. % B	<i>t</i> , °C	<i>p</i> _{mm}	Wt. % B
C ₈ H ₉ NO					
20		10.7	45.2	390.5	
25.5	192.5		48.8	435.7	
30.0		14.5	50		23.7
32.8	255.2		51.1	465.0	
36.6	293.0		55.0	517.6	
40.0		18.7	55.1	519.5	
41.1	342.6		60		29.1

A = CH₄O, Methyl alcohol; B = C₂HCl₃O, Chloral, S-L-V (325)

A = CH ₄ O, Methyl alcohol; B = C ₂ H ₆ , Ethane	
L _I + L _{II} + V, critical vaporization-condensation region (220)	
A = CH ₄ O, Methyl alcohol; B = C ₃ H ₈ , <i>n</i> -Propane	
L _I + L _{II} + V, critical vaporization-condensation region (217)	
A = CH ₄ O, Methyl alcohol; B = C ₄ H ₁₀ , <i>n</i> -Butane	
L _I + L _{II} + V, critical vaporization-condensation region (218)	
A = CH ₄ O, Methyl alcohol; B = C ₅ H ₁₂ , <i>n</i> - and <i>iso</i> -Pentane	
L _I + L _{II} + V, critical vaporization-condensation region (217, 218)	
A = CH ₄ O, Methyl alcohol; B = C ₆ H ₁₄ , Hexane	
L _I + L _{II} + V, upper critical solution point 43.8°C, 550 mm, <i>p</i> approx. constant from 31 to 83% hexane (392), critical vaporization-condensation region (217). See also p. 287.	

A = C₂HCl₃O, Chloral; B = C₂H₆O, Ethyl alcohol
 For vapor pressure of solutions saturated with the compound AB (20 to 46°C) *v.* (37, 225, 231).

A = C₂H₂*, Acetylene; B = C₂H₆, Ethane (213, 214), see also Fig. 11

Vol. % B	<i>t</i> , °C	Liquid boundary		Vapor boundary	
		<i>v</i> †	<i>p</i> _{atm.}	<i>v</i> †	<i>p</i> _{atm.}
0	35.2		61		
27	7.6	0.0032	39.6	0.0162	38.25
	14.0	.0035	45.6	.0125	44.6
	22.2	.00425	54.6	.0083	53.9
	23.75	.0052	56.27	.0067	56.0
	23.8 crit.	.0056	56.25		
	23.85 max.			.0061	56.23
41	14.0	0.0038	48.2	0.0117	46.1
	19.35	.0044	53.7	.0091	52.0
	21	.0054	55.1	.0074	54.6
	21.05 crit.	.0055	55.1		
	21.15 max.			.0060	55.0
51	14.0	0.0039	50.5	0.0116	46.4
	19.4	.0050	55.0	.0080	53.3
	19.75	.0056	55.0	.0071	54.1
	19.85 crit.	.0059	54.9	.0070	54.2
	19.95 max.			.0064	54.6
61	14.0	0.0041	48.4	0.0123	44.6
	20.1	.0053	53.7	.0081	52.1
	20.55	.0057	53.7	.0077	52.6
	20.75 crit.	.0065	53.5	.0074	53.1
	20.8 max.			.0068	53.4
68	14.0	0.00405	45.3	0.0146	40.3

A = C₂H₂*, B = C₂H₆—(Continued)

Vol. % B	<i>t</i> , °C	Liquid boundary		Vapor boundary	
		<i>v</i> †	<i>p</i> _{atm.}	<i>v</i> †	<i>p</i> _{atm.}
68	22.2	.0051	51.8	.0096	49.2
	23.05	.0055	52.35		
	23.15	.0056	52.4		
	23.4 crit.	.0063	52.3	.0080	51.2
	23.5			.0079	51.3
	23.6			.0065	52.3
	23.6			.0075	51.6
	23.75 max.			.0071	52.1
100	32.1 crit.	0.0067	48.8		

* The C₂H₂ employed contained small amounts of unknown impurities.† *v* = Volume of system referred to volume at 0°C and 1 atm. as unity.A = C₂H₄O, Acetaldehyde; B = Paraldehyde and Metaldehyde, for *p* = 760 mm (34, 410, 411, 412)(a) A + B (Parald.) + satd. soln. + V, *ca.* -123°

(b) A + B (Metald.) (mix. crys.) + satd. soln. + V, -122.8°

(c) B (Parald.) + B (Metald.) (mix. crys.) + satd. soln. + V, +12.9°

A = C₂H₆, Ethane; B = C₂H₆O, Ethyl alcohol
L_I + L_{II} + V, critical vaporization-condensation region (220)A = C₂H₆, Ethane; B = C₃H₈O, *n*-Propyl alcohol
L_I + L_{II} + V, critical vaporization-condensation region (220)A = C₂H₆, Ethane; B = C₄H₁₀O, Butyl alcohol
L_I + L_{II} + V, critical vaporization-condensation region (220)A = C₂H₆, Ethane; B = C₅H₁₂O, Amyl alcohol
L_I + L_{II} + V, critical vaporization-condensation region (220)A = C₂H₆, Ethane; B = C₁₀H₈, Naphthalene (322)

<i>t</i> , °C	<i>p</i> _{atm.}	Critical vaporization curve, solutions rich in ethane	
C ₁₀ H ₈		<i>t</i> , °C	<i>p</i> _{atm.}
80.0			
62.1	47.8	32.3†	48.1
58.4	59.3	37.4	51.7
55.1	70.4	39.4*	52.9
55.5	78.2		
55.7	86.0		
56.3	97.1		
57.4*	124.8		

* Critical endpoint.

† Critical point of ethane.

A = C₂H₆O, Ethyl alcohol; B = C₃H₈O₃, Glycerol (5, 11, 329)

Wt. % A	<i>p</i> _{mm}	Wt. % A	<i>p</i> _{mm}	Wt. % A	<i>p</i> _{mm}
<i>t</i> = 15°					
2	5.0	14	18.6	33.5	25.3
5	10.0	16.5	19.3	44.0	26.8
5.5	10.2	18.3	21.0	53.0	28.5
9.7	14.9	22.5	22.8	67.5	29.9
10	15.2	27.5	24.1	100	32.5

A = C₂H₆O; B = C₄H₁₀O, *v.* p. 361A = C₂H₆O, Ethyl alcohol; B = C₆H₆, BenzeneValues of *p*_{mm} (377, 378); cf. (439, 440); see also p. 313

Wt. A	34.8°	50°	60°	66°
0	147	271	389	477
2.07	174	326	471	578
3.85	185	347	503	620
9.47	195	371	545	677
17.38	198	379	562	702
25.64	198	382	570	711
32.15	197	380	569	711
50.14	190	371	557	697
64.91	178	351	530	671
79.88	155	311	479	609
93.28	122	257	403	520
100	103	223	354	462

A = $\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol; B = $\text{C}_4\text{H}_{10}\text{O}$, Ethyl ether
Values of p_{mm} (249); see also p. 288, 313

Wt. % B \ $t, ^\circ\text{C}$	0	5	10	15	20	25	30	35	40	45	50
0	12.4	17.3	24.3	33.2	44.4	59.7	79.3	103.1	134.6	173.3	221.1
10.04	43.3	54.6	70.1	89.2	112.4	140.7	174.8	217.3	266.3	327.5	400.5
20.07	70.9	90.2	114.4	144.5	174.0	214.2	262.9	318.5	386.5	467	558
30.09	93.7	118.1	147.2	182.1	224.8	274	334	403.5	486	582	693
40	111.8	139.5	175.0	215.5	268	324.5	395.5	476.5	571	679	804.5
50	126.7	158.5	197.9	248	302.5	368	446	536.5	641.5	762	903.5
60.07	141.1	178.1	221.7	271	333	405	491.5	590.5	708.5	843	995
68.54	151.7	190.5	236.8	293.5	359	436	529	632	758	901	1062.5
80.07	160.8	203.6	253.9	314.5	384.5	467.5	567	681.5	812	965	1136
90.03	172.0	217.0	271.7	335.5	411	499.5	604.5	726	866	1026	1208.5
100.0	185.3	233.2	291.7	360.5	442	537	647.5	775.5	921.5	1090	1276.5

A = $\text{C}_4\text{H}_{10}\text{O}$, Ethyl ether; B = $\text{C}_{14}\text{H}_8\text{O}_2$, Anthraquinone

Double retrograde condensation (406, 408, 417, 418)

A = $\text{C}_6\text{H}_4\text{N}_2\text{O}_4$, *m*-Dinitrobenzene; B = C_6H_6 , Benzene (384.5, 423)

$t, ^\circ\text{C}$	p_{mm}	C	$t, ^\circ\text{C}$	p_{mm}	C
<i>m</i> - $\text{C}_6\text{H}_4\text{N}_2\text{O}_4$					
20		35.1	32.2	108.5	
25	82.1	49.3	35.3	119.2	
28.1	92.5		38.4	134.5	
30.0		66.7	40		108
30.2	100.2		41	145.9	
30.3	100.9				

A = $\text{C}_6\text{H}_5\text{NO}_2$, Nitrobenzene; B = C_6H_{14} , *n*-Hexane (78, 199)

$L_I + L_{II} + V$

$t, ^\circ\text{C}$	p_{mm}	$t, ^\circ\text{C}$	p_{mm}	$t, ^\circ\text{C}$	p_{mm}
15.55	103.8	18.65	115.9	20.24	123.3
16.52	106.3	19.05	119.2	20.3	124.1
17.65	111.2	19.45	119.5	20.4*	125
18.22	115.0	19.85	121.8		

* Critical solution point.

A = C_6H_6 , Benzene; B = $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}_2$, Quinine (174)

$t = 25.8^\circ\text{C}$

Wt. % B	p_{mm}	Phases
79.7	77	AB + satd. soln. + V
80.0	62	AB + A_2B_3 + V
83.0		
86.2	41	A_2B_3 + 94% B (mix. crys.) + V
92.4		
94.9	33	Mix. crys. + V
95.1	33	
97.0	16	
100.0	ca. 0.0	Pure B

A = $\text{C}_6\text{H}_6\text{O}$, Phenol; B = $\text{C}_6\text{H}_7\text{N}$, Aniline, L + V diagram (208)

A = $\text{C}_6\text{H}_7\text{N}$, Aniline; B = C_6H_{12} , Cyclohexane (199)

$L_I + L_{II} + V$

$t, ^\circ\text{C}$	23.22	25.50	25.61	27.3	27.8	29.0	30.5	31.1*
p_{mm}	90.65	100.4	101.1	108.0	110.5	117.0	124	127

* Critical solution point.

A = $\text{C}_6\text{H}_7\text{N}$, Aniline; B = C_6H_{14} , *n*-Hexane (192, 199)

Wt. % B; see also p. 314

$t, ^\circ\text{C}$	L_I	L_{II}	p_{mm}
40.0	13.5	85.4	267

TWO-COMPONENT SYSTEMS—AQUEOUS

Standard Arrangement, v. p. viii

HCl, S + L + V (17)

HBr (17, 18, 20, 21, 22, 26, 27, 28)

$t, ^\circ\text{C}$	p_{mm}	C
HBr.2H ₂ O		
-25	1	175.5
-21.8	10	
-18.9	30	188.5
-16.8	60	
-14.6	120	200.0
-13.0	220	
-12.4	280	
-12.0	340	213.8
-11.6	440	
-11.3	525	224.4
-11.5	760	235.2
-12	950	243.0
-12.6	1140	248.6
-13.3	1330	
-14.0	1520	263.8
-14.8	1710	

HBr.2H₂O + HBr.H₂O

-15.5E | 1900 | 275.0

HBr.H₂O

-15.5	1900	275
-14.8	2090	
-14.0	2280	279
-11.0	3040	290
-8.7	3800	300
-7.2	4560	311
-5.8	5320	325
-4.7	6080	330
-4.0		
-3.3	8000	375

SO₂, S + L + V (17)

H₂S (258, 351, 352, 360, 361, 380)

$L_I + L_{II} + V$

$t, ^\circ\text{C}$	p_{mm}	$t, ^\circ\text{C}$	p_{mm}
Metastable			
19.4	13 150	20.8	13 600
19.8	13 200	21.2	13 680
20.6	13 500	21.4	13 810

H₂S.—(Continued)

$t, ^\circ\text{C}$	p_{mm}	$t, ^\circ\text{C}$	p_{mm}
22.8	14 330	26.4	15 660
23.0	14 400	26.9	15 770
23.7	14 670	27.5	15 960
24.6	14 990	28.0	16 190
24.8	15 070	28.2	16 260
25.1	15 200	28.4	16 340
25.4	15 200	29.1	16 530
25.6	15 280	29.2	16 640
25.8	15 390		

Stable

30.3	17 060	32.0	17 780
31.0	17 400	32.7	18 090
31.2	17 400	33.2	18 240

$t, ^\circ\text{C}$ | p_{mm} | M % H₂O in L

H₂S.6H₂O + L_I + V

0.0		0.4
10.0		0.55
17.4	12 620	0.8
21.2	13 780	1.0
26.0	15 500	1.2
29.5	16 850	1.6

H₂S.6H₂O + L_{II} + V

5.0		99.5
10.0		99.3
15.0		99.0
16.3	4 030	
17.9	4 790	
19.7	5 780	
20.0		98.6
21.0	6 540	
23.3	8 130	
24.8	9 800	
25.0		97.8
25.6	10 640	
27.4	13 000	97.2
28.5	14 820	96.8
29.2	16 190	96.45
29.5	16 850	96.3

H₂S.6H₂O + L_I + L_{II} + V

29.5	16 850	1.6 and 96.3
------	--------	--------------

H_2SeO_3 (264)

$t, ^\circ\text{C}$	p_{mm}	C	$t, ^\circ\text{C}$	p_{mm}	C
H_2SeO_3					
22.0		535.6	36.8	19.0	
32	16.5		38.3	19.5	
35.4	18.0		39.5	21	
36.1	18.5		40.3	22	
			42		905.4

NH_3 , see also Fig. 12 (1, 81, 99, 114, 138, 151, 152, 245, 263, 277, 278, 285, 306, 307, 308, 309, 312, 315, 319, 326, 337, 343, 346, 347, 390, 415, 416, 448, 454, 456); v. also p. 290

L + V system, values of p_{mm}

$t, ^\circ\text{C}$	M % B	5	10	15	20	25	30
-70							1.40
-60							3.58
-50						4.65	9.15
-40						10.3	17.6
-30				6.9	12.5	21.1	35.0
-20				14.2	24.7	40.6	65.7
-10			15.40	27.2	46.2	73.8	88.0
0	14.61	28.79	49.55	81.75	127.5	195.8	
+10	27.06	51.42	85.95	138.8	209.5	317.5	
20	51.78	87.8	142.9	224.7	335.5	494.5	
30	81.0	143.9	228.7	351.6	515.3	745.0	
40	131.8	227.5	353.5	543.0	766.9	1143.5	
50	207.5	348.0	530.2	783.5	1109	1554.5	
60	316.5	517.2	772.5	1123.5	1566	2163	
70	468.7	748.0	1099	1571.4	2161	2944	
80	676.9	1057.7	1527	2154	2920	3928	
90	955.4	1462.3	2079	2891	3874	5151	
100	1321.0	1982	2777	3814	5053	6651	
110	1790.4	2640	3671	4953	6495	8460	
120	2386	3457	4724	6337	8231	10624	
130	3129	4465	6028	8000	10300		
140	4042	5683	7592	9978			
150	5151	7142	9446				
160	6487	8881					
170	8073	10920					

$t, ^\circ\text{C}$	M % B	35	40	45	50	55	60
-90	0.31						
-80	0.95	1.73	3.22		7.97	11.61	
-70	2.58	4.53	8.01	12.27	18.81	26.80	
-60	6.29	10.69	18.30	27.21	43.96	61.05	
-50	14.06	23.12	38.35	55.55	80.8	110.4	
-40	29.1	46.5	74.7	105.9	150.6	201.9	
-30	56.2	87.3	136.6	189.8	264.9	349.5	
-20	102.4	155.1	236.5	323.3	442.3	575.2	
-10	176.9	262.2	391.2	525.5	707.0	907.5	
0	292.3	425.2	619.7	819.7	1087	1379	
+10	463.0	660.4	947.0	1234	1615	2024	
20	708.5	992.6	1401	1801	2328	2887	
30	1050	1448.6	2010	2556	3265	4010	
40	1513	2055	2810	3538	4472	5446	
50	2152	2847	3301	4788	5998	7241	
60	2195	3319	5143	6353	7882	9454	
70	3919	5128	6760	8778	10188		
80	5170	6703	8737	10616			
90	6712	8609	11120				
100	8580	10899					
110	10812						

$t, ^\circ\text{C}$	M % B	65	70	75	80	85	90	95
-90				11.71				
-80				24.54	28.22	31.29	33.81	35.98
-70	36.04	45.44	54.05	61.75	68.30	73.55	78.12	
-60	74.68	92.64	109.3	124.1	136.4	147.0	156.3	
-50	143.3	175.9	205.8	231.9	254.4	274.0	291.6	
-40	258.9	314.1	364.2	409.0	447.8	480.8	511.5	
-30	441.5	530.3	611.0	682.6	744.6	798.8	850.3	
-20	718.7	854.5	978.5	1089	1185.7	1271	1353	
-10	1120	1322	1505.5	1669	1812	1942	2066	
0	1685	1974	2235	2469	2677	2855	3048	
+10	2452	2852	3215	3541	3829	4101	4359	
20	3468	4010	4502	4941	5336	5710	6073	
30	4781	5500	6148	6731	7265	7764	8261	
40	6448	7375	8216	8977				
50	8522	9703						

 NH_3 —(Continued)

$t, ^\circ\text{C}$	M % B	p_{mm}	$t, ^\circ\text{C}$	M % B	p_{mm}
NH_3					
-77.60	100.0	45.8	-82.0	55.0	6.6
-80.5	95.0	34.4	-79.2	50.0	5.4
-84.4	90.0	23.3	-81.85	45.0	2.7
-89.0	85.0	14.3	-89.0	40.0	0.67
			-99.9	35.0	0.09
$\text{NH}_3 + (\text{NH}_3)_2\text{H}_2\text{O}$					
-93E	81.2	9.03	$(\text{NH}_3)_2\text{H}_2\text{O}$		
-91.2	80.0	10.5	-100.3E	34.6	0.083
-83.85	75.0	17.7	Ice		
-79.7	70.0	20.9	-68.7	30.0	1.6
-78.8	66.66	20.2	-46.0	25.0	6.4
-79	65.0	17.4	-31.25	20.0	11.4
-83.85	60.0	8.6	-20.1	15.0	14.1
$(\text{NH}_3)_2\text{H}_2\text{O} + (\text{NH}_3)\text{H}_2\text{O}$					
-86.35E	58.55	6.5	-11.95	10.0	13.5
			-5.35	5.0	10.3
			0.0	0.0	4.579

NH_4NO_3 (68, 120, 320, 321, 434), see further p. 293

C	p_{mm} , 100°C	C	p_{mm} , 100°C	$t, ^\circ\text{C}$	p_{mm}	C
0	760.00	160	469.2	$\text{NH}_4\text{NO}_3(\text{R}^*\text{IV}) + \text{NH}_4\text{NO}_3$		
5	745.9	180	447.6	(R? III)		
10	732.2	200	427.9	32.1	21.05	256.9
20	706.0	300	350.6	$\text{NH}_4\text{NO}_3(\text{R? III})$		
40	658.9	400	296.9	40	29.2	293.0
60	617.5	500	257.4	50	42.95	352
80	580.6	600	227.1	60	61.1	421
100	548.3	700	203.1	70	84.9	498
120	519.1	800	183.8	80	115.4	580
140	492.9	890†	169.6	$\text{NH}_4\text{NO}_3(\text{R? III}) + \text{NH}_4\text{NO}_3$		
				(Tet.* II)		
				84.2	130.3	614
				$\text{NH}_4\text{NO}_3(\text{Tet. II})$		
				90	143.9	716
				95	156.5	803
				100	169.6	890
				(105)	(183.4)	(978)

* R = orthorhombic; Tet. = tetragonal.

NH_4Cl , see further p. 293

Values of p_{mm} (120, 357, 384.5, 433, 434)

$t, ^\circ\text{C}$	0.0	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0
0	4.579	4.3	4.0	(3.8)					
10	9.210	8.6	8.1	7.6					
20	17.539	16.4	15.5	14.5					
30	31.834	29.9	28.1	26.3	24.7				
40	55.34	51.9	48.9	45.8	42.9				
50	92.54	86.8	81.7	76.6	71.8	67.5			
60	149.46	140.2	132.0	123.6	116.0	109.0			
70	233.79	219.3	206.5	193.4	181.4	170.5	160.6		
80	355.47	333.5	314.0	294.1	275.9	259.8	244.2		
90	526.00	493.5	464.6	435.2	408.2	383.6	361.4	341.1	
100	760.00	713.0	671.2	628.7	589.8	554.3	522.1	492.9	
110	1074.5	1008	949	888.9	833.8	783.7	738.2	696.8	659.2

$t, ^\circ\text{C}$	p_{mm}	C	$t, ^\circ\text{C}$	p_{mm}	C
$\alpha\text{-NH}_4\text{Cl}$					
20	13.9	37.2	$\alpha\text{-NH}_4\text{Cl} + \beta\text{-NH}_4\text{Cl}$		
25	18.5	39.3	845.1	4032	149.5
30	24.5	41.4	$\beta\text{-NH}_4\text{Cl}$		
160	2471	125.2	190	4431	154.0
170	3039	134.9	195	4924	158.2
180	3703	144.8	200	5396	162.3

NH₄Br, see further p. 293
Values of p_{mm} (70, 358, 384.5, 394, 433, 434)

$t, ^\circ\text{C}$	0	10.0	20.0	40.0	60.0	80.0	100.0	120.0	140.0
0.0	4.579	4.4	4.3	4.0	3.7				
10.0	9.210	8.9	8.6	8.0	7.4				
20.0	17.539	17.0	16.4	15.3	14.2				
30.0	31.834	30.8	29.8	27.7	25.7				
40.0	55.34	53.6	51.7	48.2	44.7	41.5			
50.0	92.54	89.6	86.5	80.5	74.8	69.4			
60.0	149.46	144.7	139.7	130.0	120.8	112.1	103.9		
70.0	233.79	226.3	218.6	203.4	188.9	175.3	162.4		
80.0	355.47	344.1	332.3	309.3	287.3	266.5	247.0	228.8	
90.0	526.00	509.2	491.8	457.6	425.1	394.3	365.5	338.5	
100.0	760.00	735.7	710.5	661.2	614.2	569.8	528.1	489.0	452.0

$t, ^\circ\text{C}$	p_{mm}	C
$\alpha\text{-NH}_4\text{Br}$		
90	329.7	133.0
95	390.2	
100	459.4	144.0
105	538.1	
110	627.3	155.4
115	728.5	
116.53	760.0	
120	843	167.3
125	971	
130	1113	179.7
135	1272	

$t, ^\circ\text{C}$	p_{mm}	C
$\alpha\text{-NH}_4\text{Br} + \beta\text{-NH}_4\text{Br}$		
137.8	1369	189.2
$\beta\text{-NH}_4\text{Br}$		
140	1450	191.8
145	1650	
150	1872	202.2
155	2117	
160	2385	212.8

$$\log x_\alpha = -\frac{372.7}{T} + 0.31978$$

$$\log x_\beta = -\frac{293.7}{T} + 0.12727$$

yield values about 0.7% lower than those reported by (394).

(NH₄)₂SO₄, see further p. 293
Values of p_{mm} (120, 384.5, 433, 434)

$t, ^\circ\text{C}$	0	5	10	20	30	40	50	60	70	80	90	100
0	4.579	4.5+	4.5-	4.4	4.2	4.1	4.0	3.9	3.8			
10	9.210	9.1	9.0	8.7	8.5	8.3	8.0	7.8	7.6			
20	17.539	17.4	17.1	16.7	16.2	15.7	15.3	14.8	14.4			
30	31.834	31.5	31.1	30.3	29.4	28.6	27.7	26.9	26.2			
40	55.34	54.7	54.1	52.6	51.1	49.6	48.2	46.8	45.5	44.2		
50	92.54	91.5	90.4	87.9	85.5	83.0	80.6	78.3	76.1	73.9		
60	149.46	147.8	146.0	142.0	138.0	134.1	130.2	126.5	122.8	119.4		
70	233.79	231.2	228.4	222.2	215.9	209.7	203.7	197.8	192.2	186.7		
80	355.47	351.6	347.2	337.8	328.3	318.9	309.7	300.8	292.2	283.9	276.0	
90	526.00	520.2	513.8	499.9	485.8	471.8	458.2	445.0	432.3	420.1	408.3	
100	760.00	751.7	742.3	722.2	701.9	681.7	662.1	643.0	624.7	607.0	590.0	573.7
110	1074.5	1063	1050	1021	992.3	963.8	936.1	909	883	858	834	811

$t, ^\circ\text{C}$	p_{mm}	C
(NH₄)₂SO₄		
0	3.8	70.7
10	7.5	73.0
20	14.2	75.45
22	16.0	75.95
24	18.1	76.45
26	20.3	77.00
28	22.8	77.50
30	25.6	78.05
40	44.1	81.05
50	73.0	84.40
60	116.7	88.00
70	180.7	91.60
80	271.9	95.30
90	398.0	99.15
100	568.5	103.3
110	793	108.15

CO₂, critical region (220, 348)
C₂H₆, Ethane (220)
L_I + L_{II} + V in neighborhood of critical point of B;
 $t = 15\text{--}32^\circ\text{C}$, $p = 33\text{--}49\text{ atm}$.

C₆H₁₂ (mix. of *n*- and *iso*-Pentane) (356)
Two liquid phases: The three-phase pressure exceeds sum of vapor pressures of pure components.

$t, ^\circ\text{C}$	$p_{\text{atm.}}$	$t, ^\circ\text{C}$	$p_{\text{atm.}}$
150	22.4	180	38.8
160	27.0	187.1	44.1
170	32.4	crit.	

C₆H₆ (356)
Two liquid phases: The three-phase pressure exceeds the sum of the vapor pressures of the pure components.

$t, ^\circ\text{C}$	$p_{\text{atm.}}$	$t, ^\circ\text{C}$	$p_{\text{atm.}}$
150	10.6	220	42.9
160	13.2	230	50.9
170	16.4	240.1	60.4
180	20.1	250.2	70.7
190	24.6	260.1	82.2
200	29.8	267.8	92.7
210	35.9	crit.	

C₆H₁₄, *n*-Hexane, see also Fig. 13 (354, 356)
L_I-V region between the three-phase curve and the critical curve
Boiling-point values for $p_{\text{atm.}}$

$t, ^\circ\text{C}$	0	2.3	5.2	8.6	11.8
170	10.69	14.45	18.05		
175		15.55	19.2		
180	12.70	16.65	20.35	22.8	
185		17.85	21.6	24.25	
190	14.97	19.1	22.9	25.8	
195		20.5	24.2	27.4	31.5
200	17.56	21.85	25.6	29.0	33.4
205		23.3	27.0	30.7	35.3
210	20.50	24.8	28.55	32.4	37.1
215		26.4	30.1	34.1	38.9
220	23.8	28.1	31.65	35.8	40.55
222		28.8	32.25	36.3	40.8
223					41.1
224				36.95	41.25
225		29.75	33.2	37.25	41.4
226				37.5	41.6
227			33.75	37.7	41.8
228			34.1	37.8	41.7
229			34.35	37.95	41.1
230		31.4	34.6	37.9	
231		31.8	34.75	37.5	
232		32.05	34.8		
233		32.25			
234.8	29.6				

(NH₄)H₂PO₄ (77, 120)

t	p_{mm}	C
(NH₄)H₂PO₄		
19	15.31	
20	16.33	
21	17.41	
22	18.51	
23	19.66	
24	20.82	
25	22.09	
26	23.47	
27	24.88	
28	26.31	
29	27.88	
30	29.57	

Wt. % B = 18.0 + 0.455*t*

C_6H_{14} .—Boiling-point values for $p_{atm.}$.—(Continued)

M % A	15.3	18.9	22.8	25.7	27.7
$t, ^\circ C$					
210	40.8				
215	42.8				
220	44.3	48.0			
222	44.8	48.3	51.0	51.8	52.1
223	44.9	48.3	50.7	51.2	
224	45.0	48.15	49.9		
225	45.0	47.75			
226	44.85	46.7			
227	44.5				
228	43.2				

Dew-point values for $p_{atm.}$

M % A	0	2.3	5.2	8.6	11.8
$t, ^\circ C$					
234.8	29.6				
233		31.4			
232		30.8	32.9		
231		30.2	32.1	35.85	
230		29.6	31.4	34.8	
229		29.2	30.8	33.9	37.6
228		28.7	30.3	33.15	36.55
227		28.2	29.8	32.5	35.6
225				31.2	34.0
222					31.95
220	23.8				

M % A	15.3	18.9	22.8	25.7	27.7
$t, ^\circ C$					
228	40.3				
227	38.75				
226	37.5	41.75			
225	36.5	40.2	47.5*		
			46.5		
224		39.05	43.4		
223		38.1	42.0	46.3	
222	34.25	37.2	40.8	44.5	46.9
221			40.0	43.2	45.2
220	33.1	35.7	39.0	42.1	44.0
218					43.0

* t - p curve passes through a temperature maximum at 225.1° , $p = 47.0$ atm. $L_I + L_{II} + V$

$t, ^\circ C$	M % B, L_I	$p_{atm.}$	$t, ^\circ C$	M % B, L_I	$p_{atm.}$
163.8	94.8	16.7	200		34.8
170		19.0	205		38.2
175		21.2	207.1	84.7	39.65
176.4	91.4	21.7	210		41.8
180		23.5	215.25	81.1	46.0
185		26.0	220		50.2
190		28.8	220.75	77.2	50.9
194.0	88.2	31.1	221.6	74.3	51.7
195		31.7	222.2*	72.3	52.1

* The ($L_I + L_{II} + V$) three-phase curve and the curve of critical points intersect at this point, i.e., critical phenomena are encountered before complete mixing takes place in mixtures containing less than 72.3 M % hexane. C_6H_{14} .—The critical fold

M % A	Press. max. $t, ^\circ C$	$p_{atm.}$	Temp. max. $t, ^\circ C$	$p_{atm.}$	Critical point $t, ^\circ C$	$p_{atm.}$
0.0	234.6	30.15	234.6	30.15	234.6	30.15
2.3	233.5	32.3	233.65	32.0	233.6	32.2
5.2	231.8	34.85	232.7	33.9	232.6	34.3
8.6	229.4	39.95	231.3	37.0	231.1	37.4
11.8	227.0	41.8	229.8	39.6	229.5	40.4
15.3	224.5	45.0	228.4	41.8	227.9	43.3
18.9	222.5	48.35	226.7	44.5	226.1	46.5
22.8	221.7	51.0	225.0	47.0	224.2	49.6
25.7			223.6	49.0	222.9	51.2
27.7			222.8	50.2	222.2	52.1
100.0					374	217.5

 C_7H_8 , Toluene (41)

Vapor phase compositions in contact with two liquid phases at ca. 760 mm.

 CH_2O_2 , Formic acid (98, 184, 186, 200, 226, 229, 336, 341)

% = Wt. % formic acid

Values of p_{mm}

$t, ^\circ C$	49.36 %	70.49 %	89.53 %
5			9.1
6			9.7
8			11.0
10			12.4
12			13.9
14	10.5	10.2	15.7
16	11.8	11.5	17.7
17	12.5	12.2	18.7
18	13.3	13.0	19.8
19	14.1	13.8	20.9
20	14.9	14.6	22.1
22	16.8	16.4	24.5
24	18.9	18.5	27.2
26	21.2	20.8	30.1
28	23.9	23.4	33.5
30	26.8	26.3	37.2
32	30.0	29.5	41.1
34	33.6	33.9	45.2
36	37.5	36.7	49.7
38	41.9	40.8	54.3
40	46.6	45.3	59.1
42		50.5	
43		53.2	
44		56.0	
105	760		
106.5			760
107.6		760	

 CH_2O_2 , Formic acid.—(Continued)

$t, ^\circ\text{C}$	22.66 %	Max. B. P.		
		%	p_{mm}	B. P., $^\circ\text{C}$
19	15.3	79.9	43	38
42	57.0	85.1	97	54
61	145.1	87.3	262	77
81	346.5	89.5	740	107.1
100	719.8	92.6	1830	135

$t, ^\circ\text{C}$	50.02 %	$t, ^\circ\text{C}$	79.8 %
17	12.0	18	12.8
32	29.5	42	50.6
43	53.8	60	122.5
55	98.4	61	128.3
70	195.5	81	294.4
81	310.5	100	595.1
91	459		
100	641		

 $C_2H_2O_4$, Oxalic acid (384.5, 423)

$t, ^\circ C$	p_{mm}	C
40	52.5	21.52
50	85.9	31.46
60	135.8	44.32
70	208.1	61.08
80	310.7	84.5

B = Various esters and ethers

Values of p_{mm} for saturated solutions of the esters (328)

B	0°	10°	20°	30°
Methyl formate.....	186.7	296.3	451.7	729.8
Ethyl formate.....	74.6	125.4	202.1	312.8
Propyl formate.....	25.6	46.0	79.8	131.9
Methyl acetate.....	61.3	104.4	169.3	264.0
Ethyl acetate.....	28.4	49.9	85.4	140.2
Propyl acetate.....	12.0	22.9	41.8	72.5
Methyl propionate.....	25.5	46.2	79.3	132.0
Ethyl propionate.....	12.9	24.6	45.0	78.0
Propyl propionate.....	7.3	14.2	26.9	48.5
Ethyl ether.....	185.1	292.7	445.0	652.1
Ethyl sulfide.....	20.6	36.9	62.9	105.3

C₃H₆O₂, Methyl acetate (257); v. also p. 290

M _B /l	25°, p _{mm}		35°, p _{mm}	
	H ₂ O	C ₃ H ₆ O ₂	H ₂ O	C ₃ H ₆ O ₂
0.2542	24.0	22.5	42.1	38.3
0.5084	24.1	43.7	41.9	73.9
1.017	23.5	85.3	41.6	134.8
1.525	22.8	122.0	40.6	183.9
2.033	23.3	149.2	40.9	226.6

**C₃H₈O, n-Propyl alcohol (222)
v. also p. 290**

t, °C	p _{atm.}	t, °C	p _{atm.}
2.5 Wt. % H ₂ O			
95.1	1.04	183.1	13.55
98.1	1.17	216.8	25.12
105.1	1.52	227.8	30.61
116.8	2.25	245.1	40.14
130.8	3.54	254.6	47.4
145.4	5.57	264.9*	55.9
160.2	7.99		
25 Wt. % H ₂ O			
166.9	11.20	241.4	48.0
179.1	14.56	250.2	56.2
182.7	15.76	261.8	67.3
215.7	30.57	275.9*	83.8
224.6	35.85		

* Critical point. The critical point of pure C₃H₈O was 264.0°C and 51.51 atm.

C₄H₆O₄, Succinic acid (384.5, 423)

t, °C	p _{mm}	C
C ₄ H ₆ O ₄		
30	31.3	10.58
40	53.9	16.21
50	89.2	24.42
60	142.7	35.83
70	220.9	51.07
80	332.7	70.79
90	487.6	95.5

C₄H₆O₆, Tartaric acid (384.5, 422)

t, °C	p _{mm}	C
C ₄ H ₆ O ₆		
20.0		139.4
22.7	18.4	
25.0		147.4
26.2	22.0	
29.1	25.4	
30.0		156.2
31.2	28.1	
34.6	33.3	
38.1	39.2	
40.0		176.0
41.7	46.6	
43.2	49.9	
46.3	57.6	
50.0		195.0

C₄H₁₀O, Ethyl ether, see also Fig. 14 (220, 249, 266, 355)

Wt. % H ₂ O			
t, °C	L _I	L _{II}	p _{atm.}
0	1.0	88.4	0.247
5	1.05	89.8	.311
10	1.12	91.3	.388
15	1.15	92.4	.477
20	1.20	93.5	.585

C₄H₁₀O.—(Continued)

t, °C	Wt. % B		p _{mm}
	L _I	L _{II}	
40	7.30	81.7	82
45	7.15	81.15	
50	7.05	80.5	135
55	7.05	79.8	174
60	7.00	79.1	219
65	7.00	78.3	>287
70	7.05	77.5	344
75	7.20	76.6	<437
80	7.45	75.6	529
85	7.85	74.5	651
90	8.30	73.3	794
95	8.85	71.95	962
100	9.55	70.5	1155
105	10.35	68.8	1375
110	11.40	67.0	1630
115	12.65	64.9	1925
120	14.25	62.3	2255
122	15.05	60.9	2410
124	15.90	59.2	2560
126	17.00	57.1	2720
128	18.35	54.6	2885
130	20.2	51.1	3055
131	21.5	48.8	
132	24.0	44.9	3220
132.5	26.0	40.5	
132.8*	33.0†		3290

L_I increases in alcoholic content as *t* decreases from 60°C; presumably there is a lower critical solution point which has not been reached experimentally, unless the freezing-point curve, which is also unknown, intersects the L_I-L_{II} boundary.

* Critical solution point.

† Flat max. on the temperature-composition curve for the two-phase system extending over a range of ca. 6 % in composition.

C₅H₈O₂, Acetylacetone (392)

Critical solution isotherm, 91.2°C

Wt. % B	p _{mm}	Wt. % B	p _{mm}
0	550.2	51.60	647.2
11.77	637.0	59.22	649.2
19.56	638.4	74.14	648.0
24.12	642.2	80.08	646.0
39.14	648.0	100.0	186.3

C₆H₆O, Phenol (126, 227, 332, 371, 392, 413), see also Fig. 15 and p. 291

t, °C	Wt. % B			p _{mm}
	L _I	L _{II}	V	
15	8.8	72.3		11.4
20	8.8	71.4	5.55	15.7
25	8.9	70.4		22.6
30	9.1	69.4	6.00	29.5
35	9.4	68.2		39.8
40	9.9	66.8	6.55	52.9
45	10.7	65.2		69.6
50	12.0	63.2	7.25	90.9
55	14.0	60.3		118

C₆H₆O.—(Continued)

t, °C	Wt. % B			p _{mm}
	L _I	L _{II}	V	
60	17.1	56.2	8.15	150
65	21.9	49.2		189
68.5	33.5	33.5	9.20	220

C₆H₆O₂, Resorcinol (422)

t, °C	p _{mm}	C
C ₆ H ₆ O ₂		
20.0	15.27	103
22.5	17.53	
25.0	20.04	117
27.5	22.84	
30.0	25.93	131
32.5	29.33	
35.0	33.07	
37.5	37.16	
40.0	41.58	161

C₁₂H₂₂O₁₁, Sucrose (252, 260, 305, 384.5)

t, °C	p _{mm}	C
C ₁₂ H ₂₂ O ₁₁		
0	4.04	179.2
10	8.03	190.5
20	15.1	203.9
30	26.9	219.5
40	45.8	238.1
50	74.6	260.4
60	116.5	287.3
70	174	320.4

HCN (385)

x _B	p _{mm} , 18°C	
	HCN	H ₂ O
0.05	167.0	15.1
.10	283.4	14.7
.15	349.5	14.2
.20	381.0	13.8
.25	398.5	13.5
.30	409.1	13.3
.35	417.2	13.2
.40	421.3	12.9
.45	425.4	12.7
.50	430.6	12.4
.55	434.8	12.0
.60	442.0	11.6
.65	451.0	11.1
.70	462.0	10.4
.75	474.0	9.8
.80	488.0	9.0
.85	503.0	7.9
.90	521.0	6.4
.95	540.5	4.0
1.00	566.2	0

C₆H₇N, Aniline (3, 371)

Values of Wt. % B

t, °C	L _I	L _{II}	V
41	3.7	94.4	13.4
49.5	3.9	94.2	16.7
56.3	4.1	93.9	16.8*
64.5	4.4	93.4	17.5
75.0	5.0	92.75	18.3†
82.0	5.4	92.2	19.7
90.0	6.0	91.5	19.8
100.0	6.9	90.5	
125	10.1	86.9	
150	17.5	79.1	
167	47		

C₆H₇N.—(Continued)
Values of Wt. % B.—(Continued)

56.3°C isotherm			75.0°C isotherm		
L _I	V	p _{mm}	L _I	V	p _{mm}
0	0	125.7	0	0	289.3
1.86	6.84	126	1.38	5.6	297
2.52	8.84		2.88	10.8	300
3.35	10.51		3.46	12.1	301
3.37	11.2		3.49	12.1	301
3.49	11.6		4.18	13.7	301
3.91	12.8		4.6	14.4	302
3.95			4.7	14.8	302
4.3†	15.5		4.9	15.1	302
			5.2§	18.2	303

* 127 mm. † 303 mm. ‡ L_{II}, ca. 94.5 %. § L_{II}, ca. 94 %.

C₆H₁₅N, Triethylamine (225, 384.5)

Values of p_{mm}

Wt. % B	0	1.35	4.40	10.95	23.34	41.69	84.84	93.83	100.0
t, °C									
6	7.013				24.15				
8		14.94			27.67			34.68	
10	9.209	16.43	21.58	28.07	31.69	33.26		38.57	37.4
12		18.25	25.05	33.25	36.3	37.9	43.4	42.85	40.4
14	11.99	20.55	29.1	38.7	41.55	43.0	48.15	47.65	44.0
16		23.15	33.8	45.0	47.55	48.65	53.55	53.0	48.1
18	15.48	26.1	39.25	52.25	54.2	54.95	59.25	58.95	52.8
20		29.4	45.6	60.3	61.3	62.2	65.6	65.5	58.0
22	19.83	33.15	52.95	68.8	69.2	69.8	72.9	72.9	63.7
24		37.4	61.5	76.9	77.8	77.8	80.8	80.5	70.0
26	25.21	42.2	71.3	85.7	87.2	86.5	89.3	88.9	76.8
28		47.7	81.4	95.0		96.0	98.6	98.3	84.1
30	31.82	54.0	93.9	105.2		106.2	108.6	108.5	92.1
32		61.0	107.8	116.3		117.5	119.6	119.7	100.7
34	39.90	68.8	123.2	128.6		129.8	131.7	131.8	109.9
36		77.5	140.2	141.9		143.2	144.8	144.9	119.8
38	49.69	87.1	156.5	156.1		157.4	159.2	159.0	130.6
40		97.8	172.7	171.5		172.6	174.8	174.2	142.1
42	61.50	109.6	189.7	188.3		188.7	191.6	190.6	154.6
44		122.3	207.8	206.3		206.4	209.5	208.4	168.0
46	75.65	132.0						227.7	182.4
48		150.9							197.9
50	92.51	167.2	Two liquid phases						214.4

L_I + L_{II} + V, boundary curve

t, °C	Wt. % B			p _{mm}
	L _I	L _{II}	V	
18.6	51.9			
20	20.9	92.9	94.1	64.6
21	14.8	94.0	93.9	67.9
22	10.3	95.0	93.6	70.1
25	7.3	95.2		
30	5.8	96.6		
35	4.6	96.5		
40	3.7	96.5		
50	2.9	96.4		

Change in critical-solution temperature with pressure

t, °C.....	18.3	18.45	19.63	19.95	20.0	21.2	21.3	21.3
p _{atm}	0	9.5	63	78	79	140	144	146

C₈H₁₁N, 2, 4, 6-Trimethylpyridine (γ-Collidine)

Values of p_{mm} (225, 384.5)

Wt. % B	0	6	52.9	58.68	85.74	95.8	98.7	100
t, °C								
10	9.21	9.1	9.8					2.7
15	12.79	12.7	13.0	13.1		10.4	7.9	3.3
20	17.54	18.2	17.6	17.9	17.5	14.3	10.9	4.1
25	23.75	24.6	24.2	24.1	24.4	19.3	15.1	5.2
	Two liquid phases							

C₈H₁₁N: Values of p_{mm}.—(Continued)

Wt. % B	0	6	52.9	58.68	85.74	95.8	98.7	100
t, °C								
30	31.82	33.1	32.3	32.3	32.9	26.6	20.8	6.3
35	42.18	44.2	43.4	42.9	43.2	36.1	28.7	7.7
40	55.32	57.7	56.3	56.5	57.0	49.0	38.1	9.4
45	71.88	74.8	74.1	73.6	74.8	65.6	50.5	11.7
50	92.51	96.4	95.2	95.0	96.0	85.8	67.2	14.8
55	118.04	122.3	120.9	121.9	124.0	111.5	87.4	18.9
60	149.38							23.8
65	187.54	Two liquid phases						31.0

NH₄HCO₃ (67, 295, 437)

With negligibly small vapor space, log₁₀ p_{mm} = 2.55169 + 0.0499125t - 851.5 × 10⁻⁶t² + 10225.6 × 10⁻⁹t³.

CH₄N₂O, Urea (120, 384.5)

t, °C	p _{mm}	C
	CH ₄ N ₂ O	
19	13.37	
20	14.15	79.0
21	14.93	
22	15.73	
23	16.56	
24	17.44	
25	18.39	
26	19.39	
27	20.46	
28	21.61	
29	22.76	
30	23.93	93.0

Tl, Salts (57)

Salt	t at 1 atm.	C
TlCl	100.01	2.41†
Tl ₂ SO ₄	100.32	18.45†

TiNO₃ (10, 33, 384.5)

t, °C	p _{mm}	C
	TiNO ₃ (R)*	
90	490.2	200
92	521.6	
94	554.6	
96	589.3	
98	625.7	
100	663.9	414
101	683.7	
102	703.9	
103	724.6	
104	745.7	
104.65	760.0	
105	767.4	594
106	789.6	
107	812.3	
108	835.4	
110	853.9	
196	760.0	

* R = rhombic.

ZnCl₂ (237, 272, 281, 434)

t, °C	p _{mm}	C
	ZnCl ₂	
20	<2	
90	22	
100	35	615.0
110	57	
120	86	

ZnCl₂.—(Continued)

t, °C	p _{mm}	C
	ZnCl ₂	
130	118	
140	145	
150	193	
160	258	

ZnSO₄ (238, 382, 384.5, 434)

t, °C	p _{mm}	C
20	15.3	†
105	760	85.7†

Zn(NO₃)₂ (240)

t, °C	p _{mm}
20	9.6†

CdBr₂ (237, 434)

t, °C	p _{mm}
10	6†
20	10†
30	16†
40	40†
68	122†
70	188†
80	279†

CdSO₄ (82, 144.5)

t, °C	p _{mm}	C
	CdSO ₄ · $\frac{8}{3}$ H ₂ O	
0	3.94	75.6
	CdSO ₄ ·H ₂ O	
75.87	279.3	76.3
80.03	334.4	68.7
90.04	500.3	63.1
100.0	729.8	60.8

Cd(NO₃)₂ (239)

t, °C	p _{mm}
20	10†

CuCl₂ (103, 237, 384.5, 423)

t, °C	p _{mm}	C
	CuCl ₂ ·2H ₂ O	
20	11.94	77.0
22	13.49	
25	16.13	78.6
28	19.20	
30	21.52	80.3
35	28.4	
38	33.4	
41	39.1	83.8

CuSO₄ (82, 203, 271.5, 304, 382,**434)**

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
CuSO₄·5H₂O		
60	141.6	40.0
65	175.9	
70	216.9	
75	265.5	
80	322.7	
85	390.1	
90	468.1	
95	558.6	
CuSO₄·3H₂O*		
100	662.8	75.4
104.2	760.0	
105	781.9	

* Reported values for the transition 5H₂O ↔ 3H₂O vary between 55 and ca. 100°. The S-L-V curve and dissociation pressure curve intersect at 96.5°; direct determination yields 95.7 ± 0.2° for the transition, and a small heat effect at ca. 56°.

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
AgNO₃ (33).		
AgNO₃ (R)*		
133	760	1941
135	800	
150	960	
AgNO₃ (R) + AgNO₃ (trig.)		
159.8		
AgNO₃ (trig.)*		
160	1000	
167	1015	
170	1010	
185	900	
191	760	

* R = Rhombic; trig. = trigonal.

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
MnCl₂ (101, 335, 434)		
α-MnCl₂·4H₂O		
15.5	7.85	
20.0	9.45	
30.0	17.0	80.7
40.0	28.7	
50.0	46.3	98.1
57.8	62.9	
α-MnCl₂·4H₂O + MnCl₂·2H₂O		
58.10		105.7
MnCl₂·2H₂O		
60	64.8	108.6
70.5	110.3	
80.5	172.1	112.8
90.0	262.0	

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
MnBr₂ (237, 467)		
MnBr₂·4H₂O		
20	5	59.4
60	40	
100	200	69.6

MnI₂ (237)

<i>t</i> , °C	<i>p</i> _{mm}
MnI₂·4H₂O	
20	3.5
50	7
60	13
80	42.5
100	104
MnI₂·2H₂O	
110	154
MnI₂·H₂O	
130	210

MnSO₄ (238)

<i>t</i> , °C	<i>p</i> _{mm}
MnSO₄·5H₂O	
20	11.3
MnSO₄·4H₂O	
60	162

Mn(NO₃)₂ (239, 467)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
20	7.4	137
70	80	

FeCl₃ (32)

<i>t</i> = 15°C	<i>p</i> _{mm}	Solid =
<i>C</i>		Fe ₂ Cl ₆ +
43	6.0	12H ₂ O
116m	1.4	12H ₂ O
99.6m	2.3	7H ₂ O
121.0m	1.3	5H ₂ O
	1.8	12H ₂ O + 7H ₂ O*

* Si + Si + V.

CoCl₂ (96, 103, 384.5, 434)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
CoCl₂·6H₂O (red)		
25	15.3	52.7
30	19.7	
35	25.0	61.3
40	31.3	
45	38.5	
50	45.9	
CoCl₂·6H₂O + CoCl₂·2H₂O		
52.4	48.5	
CoCl₂·2H₂O (blue)		
55	55.4	
60	71.2	90.5
65	90.8	
70	114.8	
80	179.6	
90	273.6	
100	406.6	104.0

CoSO₄ (82, 384.5)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
CoSO₄·7H₂O + CoSO₄·6H₂O		
45.3	67.0	
CoSO₄·6H₂O		
50.2	84.9	55.3
55.3	107.7	
60.2	134.9	60.5
65.2	167.3	
70.2	207.3	65.8

NiCl₂ (103, 110, 384.5)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
NiCl₂·6H₂O		
19.8	9.6	64.0
24.1	12.0	
30.3	17.0	
31.0	17.5	69.5
35.1	21.5	
36.25	22.8	
NiCl₂·6H₂O + NiCl₂·4H₂O		
36.85	23.5	
NiCl₂·4H₂O		
40.6	28.9	73.6
45.2	36.7	
48.3	42.6	
54.1	56.4	

CrCl₂ (193)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
CrCl₂·3H₂O (?)		
49	27.6	
50	28.8	
51	30.3	
52	32.5	
55	39.7	
60	56.0	
65	78.4	

H₃BO₃ (236, 391, 434)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
H₃BO₃		
5	6	
10	7	3.5
15	12	
103.3	760	46.9

(NH₄)₂Al₂(SO₄)₄ (256)

<i>t</i> , °C	<i>p</i> _{mm}
(NH₄)₂Al₂(SO₄)₄·24H₂O	
60	141.8
65	177.0
70	218.5
75	266.4
80	319.8
85	376.9
90	421.7

MgCl₂ (103, 165, 185, 237, 247, 340, 384.5, 433, 434), see further p. 295.

<i>C</i>	0°C	100°C
0	4.579	760.00
1	4.55	756.3
2	4.53	754.6
3	4.51	749.3
4	4.48	745.7
5	4.45	741.9
6	4.42	737.7
8	4.36	728.7
10	4.29	718.5
15	4.07	688
20	3.80	652
25	3.49	609
30	3.16	561
35	2.80	511
40	2.44	460

MgCl₂—(Continued)

<i>C</i>	0°C	100°C
45	2.08	408
50	1.73	358
55		309
60		264
65		223
70		186
<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
Ice		
0	4.579	0
-10	1.95	13.0
-20	0.77	20.0
-30	0.29	24.7
Ice + MgCl₂·12H₂O		
-33.5	0.20	26.2
MgCl₂·12H₂O		
-30	0.27	27.9
-20	0.53	36.5
-18	0.58	39.3
-17	0.59	41.3
-16.8	0.59	41.9
-16.6	0.58	42.6
-16.4	0.56	44.05
-16.6	0.52	46.0
MgCl₂·12H₂O + α-MgCl₂·8H₂O		
-16.8E	0.50	46.5
MgCl₂·12H₂O + β-MgCl₂·8H₂O		
-17.4mE	0.45	47.6
MgCl₂·12H₂O + MgCl₂·6H₂O		
-19.4mE	0.34	50.2
α-MgCl₂·8H₂O		
-15	0.57	47.0
-10	0.82	48.8
-5	1.10	51.0
β-MgCl₂·8H₂O		
-15m	0.54	48.6
-10m	0.74	51.0
β-MgCl₂·8H₂O + MgCl₂·6H₂O		
-9.6mU	0.76	51.3
α-MgCl₂·8H₂O + MgCl₂·6H₂O		
-3.4U	1.22	51.9
MgCl₂·6H₂O		
0	1.56	52.3
10	3.08	53.5
20	5.77	54.7
30	10.3	56.1
40	17.4	57.6
50	28.3	59.2
60	44.0	61.1
70	65.7	63.4
80	93.8	66.0
90	128.5	69.2
100	165.4	73.0
110	195.3	78.2
112	197.9	79.5
	max.	
114	196.4	81.3
116	186.4	83.8
MgCl₂·6H₂O + MgCl₂·4H₂O		
116.7U	175.5	85.5
MgCl₂·4H₂O		
120	192	86.4
130	248	88.9
140	316	91.8

MgCl₂—(Continued)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
MgCl₂·4H₂O		
160	459	100.1
175	516	112
	max.	
180	470	121
MgCl₂·4H₂O + MgCl₂·2H₂O		
181.5U	427	126

MgBr₂ (384.5, 434)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
108	760	75.0†

CaCl₂ (15, 16, 30, 31, 51, 52, 60, 107, 108, 119, 141, 159, 180, 181, 185, 187, 194, 234, 242, 248, 267, 268, 269, 302, 313, 317, 318, 344, 364, 386, 433, 434, 444, 460)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
Ice + CaCl₂·6H₂O		
-50.3	0.03	44.0
CaCl₂·6H₂O		
0	2.08	60.0
+ 5	2.74	63.7
10	3.71	65.7
15	4.76	69.4
20	6.06	73.2
25	6.97	81.4
27	7.28	85.9
28.5	7.36	90.9
	max.	
29	7.33	93.2
29.5	7.22	96.1
CaCl₂·6H₂O + α-CaCl₂·4H₂O		
29.93U	6.85	101.2
CaCl₂·6H₂O		
29.95m	6.70	102.70
CaCl₂·6H₂O + β-CaCl₂·4H₂O		
29.16mE	5.48	112.9
CaCl₂·6H₂O + CaCl₂·2H₂O		
27.6mE	4.27	123.6
α-CaCl₂·4H₂O		
20m	4.18	91.0
25m	5.38	96
α-CaCl₂·4H₂O + CaCl₂·6H₂O		
29.93U	6.85	101.2
α-CaCl₂·4H₂O		
35	8.63	107.3
40	10.53	115.3
α-CaCl₂·4H₂O + CaCl₂·2H₂O		
45.3U	12.06	130.2
β-CaCl₂·4H₂O		
20m	3.34	104.5
25m	4.41	108.8
β-CaCl₂·4H₂O + CaCl₂·6H₂O		
29.16mE	5.48	112.9
β-CaCl₂·4H₂O		
30m	5.71	113.9
35m	7.21	120.5
β-CaCl₂·4H₂O + CaCl₂·2H₂O		
38.4mU	8.19	127.5
CaCl₂·2H₂O		
30m	4.97	124.4
35m	6.72	126.2

CaCl₂—(Continued)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
CaCl₂·2H₂O + β-CaCl₂·4H₂O		
38.4mU	8.19	127.5
CaCl₂·2H₂O		
40m	8.97	128.1
CaCl₂·2H₂O + α-CaCl₂·4H₂O		
45.3U	12.06	130.2
CaCl₂·2H₂O		
50	15.5	132.2
60	25.7	136.8
70	41.2	141.6
80	63.9	146.8
90	95.2	152.6
100	138	159
120	268	172
140	467.5	191
160	719	223
170	815	255
172	825	265
	max.	
CaCl₂·2H₂O + CaCl₂·H₂O		
175.5U	796	297
CaCl₂·2H₂O		
175.7m	771	308
Ca(NO₃)₂		
(44, 45, 124, 125, 434, 436)		
<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
α-Ca(NO₃)₂·4H₂O + Ice		
-28.7E	0.32	75
α-Ca(NO₃)₂·4H₂O		
0	2.7	102
5	3.9	108
10	5.2	115
15	6.9	122
20	9.4	129
25	12.0	138
30	14.9	151.3
35	17.7	166.7
37	18.9	174.3
39	19.5	183.8
40	19.7	189.7
	max.	
41	19.7	197.2
42	19.3	208.2
42.5	19.0	218.5
42.7	18.6	227.65
α-Ca(NO₃)₂·4H₂O + Ca-		
(NO₃)₂·3H₂O		
42.7E	18.0	242.5
α-Ca(NO₃)₂·4H₂O		
42m	13.8	256
41m	12.3	272
α-Ca(NO₃)₂·4H₂O + Ca-		
(NO₃)₂·2H₂O		
40.0mE	11.0	289
α-Ca(NO₃)₂·4H₂O		
38m	8.6	306
35m	6.4	335
α-Ca(NO₃)₂·4H₂O + Ca-		
(NO₃)₂		
32.7mE	4.5	357
α-Ca(NO₃)₂·4H₂O		
30m	3.9	383
20m	1.5	
15m	1.2	

Ca(NO₃)₂—(Continued)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
Ca(NO₃)₂·3H₂O		
35m	13.3	
40m	16.2	237
α-Ca(NO₃)₂·4H₂O + Ca-		
(NO₃)₂·3H₂O		
42.7E	18.0	242.5
Ca(NO₃)₂·3H₂O		
44	18.8	247
46	19.8	255
48	20.5	264
49	20.6	271
	max.	
50	20.5	280
50.5	20.2	286
51.1	19.0	303.55
51	16.8	320
Ca(NO₃)₂·3H₂O + Ca-		
(NO₃)₂·2H₂O		
50.6E	15.4	337
Ca(NO₃)₂·3H₂O + Ca(NO₃)₂		
49.8mE	14.3	357
Ca(NO₃)₂·2H₂O		
20m	4.25	
30m	7.1	
α-Ca(NO₃)₂·4H₂O + Ca-		
(NO₃)₂·2H₂O		
40.0mE	11.0	289
Ca(NO₃)₂·2H₂O		
45m	13.2	
48m	14.4	316
Ca(NO₃)₂·3H₂O + Ca(NO₃)₂·-		
2H₂O		
50.6E	15.4	337
Ca(NO₃)₂·2H₂O + Ca(NO₃)₂		
51.9U	16.0	358
Ca(NO₃)₂		
30m	4.2	356
α-Ca(NO₃)₂·4H₂O + Ca(NO₃)₂		
32.7mE	4.5	357
Ca(NO₃)₂		
35m	5.9	
40m	8.0	
45m	10.8	
48m	12.8	
Ca(NO₃)₂·3H₂O + Ca(NO₃)₂		
49.8mE	14.3	357.5
Ca(NO₃)₂·2H₂O + Ca(NO₃)₂		
51.9U	16.0	358
Ca(NO₃)₂		
55	19	
60	24.9	358
151	760.0	376

Values of *p*_{mm} *

<i>C</i>	20°	30°	40°	50°	60°
25.3	16.4	29.9	52.6	86.8	140.6
44.1	15.3	27.6	48.0	80.2	130.5
98.8	11.3	20.6	36.1	61.3	99.7
144.5	8.2	15.1	26.6	45.3	75.0
200	5.4	10.4	18.7	31.6	52.7
260	3.7	6.9	12.7	21.9	36.8
288	3.2	6.0	10.7	18.9	31.9
295	3.1	5.8	10.4	18.0	30.0
322	2.5	4.9	9.2	16.2	27.5
333	2.4	4.6	8.6	15.1	25.5
342	2.3	4.5	8.4	14.8	25.0

* See also p. 295.

Ca(NO₃)₂—(Continued)

<i>C</i>	100°	<i>C</i>	100°
0	760.00	44.4	655.8
6.69	746.9	47.3	647.7
12.61	735.3	59.3	614.4
18.62	719.8	70.7	583.8
22.7	710.1	72.5	578.4
28.4	697.4	81.1	556.6
36.4	676.6	168.1	356.6

SrCl₂ (141, 384.5, 434)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
116	760.0	105.9†

Sr(NO₂)₂ (301)

112.5	763	210†
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Sr(NO₃)₂ (57)

106.79	760.0	113†
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Ba(OH)₂ (46, 235, 434)

Ba(OH)₂·3H₂O		
100.0	520	
109	732	219

BaCl₂ (423, 434)

BaCl₂·2H₂O		
25	21.4	37
30	28.6	38.2
35	37.7	
40	49.3	40.7
45	63.8	
50	81.7	43.6
55	103.9	
100	660	58.8

Ba(NO₂)₂ (301)

114	769.5	450†
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Ba(NO₃)₂ (384.5, 434)

101.5	760.0	36.2†
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LiCl (63, 106, 171, 250, 384.5, 434, 443, 444)

LiCl·3H₂O + LiCl·2H₂O		
-16.5	0.43	
LiCl·2H₂O		
0.0	0.88	63.5
+10.0	1.32	72.3
LiCl·2H₂O + LiCl·H₂O		
12.5	1.44	74.6
LiCl·H₂O		
20	2.13	78.7
30	3.56	84.3
40	5.85	90.1
50	9.6	96.2
60	15.2	102.4
70	23.2	108.9
80	35	115.7
90	51	122.6
100	73	129.6
LiCl·H₂O + LiCl		
100.5	74	129.9
LiCl		
110	131	131.7
120	240	133.9

LiBr, see further p. 296Values of p_{mm} (63, 64, 65, 171, 207, 384.5, 434)

$t, ^\circ\text{C}$	0	20	40	60	80	100
0	4.579	17.539	55.34	149.46	355.47	760.00
5	4.5	17.2	54.3	146.6	349	746
10	4.4	16.8	53.0	143.3	341	729
20	4.1	15.8	50.0	135.3	322	690
40	3.4	13.2	41.9	114.2	274	591
60	2.6	10.1	32.6	89.6	217	473
80	1.8	7.2	23.5	65.6	161.3	356.5
100	1.2	4.9	16.2	45.9	114.3	256.3
120	0.8	3.3	11.0	31.6	79.5	180.5
140	0.56	2.3	7.7	22.1	56.2	129.0
160		1.6	5.5	15.9	41.0	95.6
180			4.0	11.9	31.2	74.5
200			3.1	9.3	25.1	62.0
220				7.5	20.5	51.5
240					17.4	44.3
260						38.8

LiBr—(Continued)

$t, ^\circ\text{C}$	p_{mm}	C
LiBr.3H₂O		
(-20)	0.24	100.5
(-10)	0.36	122.0
0.0	0.5	146
LiBr.3H₂O + LiBr.2H₂O		
+4.0	0.54	158
LiBr.2H₂O		
10.0	0.73	166
20.0	1.2	178.5
30.0	1.9	191
40.0	2.9	204
LiBr.2H₂O + LiBr.H₂O		
44.0	3.46	209
LiBr.H₂O*		
50	4.6	214
60	7.2	224
70	11.1	234.5
80	16.8	245.5
90	25.2	256
100	37.3	266.5
110	54.3	277

* LiBr.H₂O transforms into anhydrous LiBr at ca. 159°, $p = \text{ca. } 228 \text{ mm.}$ **LiI** (144.5, 170, 384.5, 434), see further p. 296

C	p_{mm} 100°C	C	p_{mm} 100°C
0	760.0	140	246.3
5	750.3	160	184.9
10	739.6	180	139.8
20	715.2	200	107.1
40	648.6	250	58.7
60	578.9	300	35.0
80	494.0	350	22.4
100	406.7	400	15.1
120	323.6	450	10.7

LiI—(Continued)

t	p_{mm}	C
LiI.3H₂O		
0	0.4	152
10	0.8	158
20	1.5	164
30	2.6	171
40	4.4	179
50	7.1	189
60	11.2	201
70	15.0	222
72	15.3	230
	max.	
74	15.25	240
75.2	15.0	247.7
74	10.8	276
72	8.3	289
LiI.3H₂O + LiI.2H₂O		
70.5E	7.1	297
LiI.2H₂O		
72	7.2	305
74	7.4	315
	max.	
76	7.2	330
78.0	6.9	349
79.0	6.1	371.5
LiI.2H₂O + LiI.H₂O		
78.2E	4.5	410
LiI.H₂O		
90	6.7	444
100	8.7	481
110	11.0	525
120	12.6	588
	max.	
125	12.5	633
128	11.9	670
130.5	9.4	743.1
LiI.H₂O + LiI.½H₂O		
129E	6.5	810
LiI.½H₂O		
130	6.9	830
140	7.2	860

LiNO₃ (117, 243, 384.5, 434)

t	p_{mm}	C
LiNO₃.3H₂O		
0	2.9	53.65
10	5.6	60.35
20	9.5	71.75
25	11.6	82.75
26	11.9	85.90
27	12.2	89.85
28	12.2	95.90
29	11.8	105.0
29.5	11.3	113.0
29.6	11.1	115.2
29.7	10.9	117.8
	max.	
29.8	10.6	121.2
29.87	10.1	127.6
29.8	9.5	132.5
29.7	9.3	135.3
29.6	9.1	137.3
LiNO₃.3H₂O + LiNO₃.½H₂O		
29.55E	9.0	138.3
LiNO₃.½H₂O		
30.0	9.2	138.9
35	11.8	142.9
40	14.8	148.9
50	22.6	160.5
60	32.3	177.4
LiNO₃.½H₂O + LiNO₃		
61.1	33.1	180.6
LiNO₃		
62	34.2	181.9
65	38.1	186.1
70	45.1	193.6
75	52.8	201.9

NaOH; see also p. 370

$t, ^\circ\text{C}$	p_{mm}	C
NaOH.4H₂O		
0	2.3	42
NaOH.4H₂O + NaOH.½H₂O		
5	2.4	47.5
NaOH.½H₂O		
10	3.0	51.5
12.5	3.2	54.1
	max.	
15.0	2.9	61.5
15.5	2.8	63.5
15.0	2.3	67.1
12.5	1.4	74.6
10.0	1.0	78.4
5.0	0.54	83.5
NaOH.½H₂O + NaOH.2H₂O		
0.75E	0.35	
NaOH.2H₂O + NaOH.H₂O		
12.0U	0.42	103
NaOH.H₂O		
20	0.61	109
30	0.91	117.5
40	1.2	129
50	1.3	145
60	1.0	174
62.5	0.7	190.7
64.0	0.4	211
64.3	0.3	222.3
64.0	0.16	240
62.5	0.06	269

NaOH—(Continued)

$t, ^\circ\text{C}$	p_{mm}	C
NaOH.H₂O + α-NaOH		
61.5U	0.025	295
α-NaOH		
80	0.075	314
100	0.25	338
150	4.4	416
200	54	555
220	120	645
240	210	785
260	260	990
	max.	
280	195	1500
300	15	3350
α-NaOH + β-NaOH		
303	0.8	4200
β-NaOH		
310	0.04	6550
322	0.00*	∞

* p given represents the partial pressure of H₂O vapor only. The total pressure at this point is the vapor pressure of NaOH, which is $0.03 \pm 0.02 \text{ mm.}$ **NaF** (73, 434)

C	p_{mm} 100°C	C	p_{mm} 100°C
0.00	760.00	3.00	743.1
1.00	754.4	4.00	737.2
2.00	748.8	4.29†	735.4

NaCl; see also p. 370

$t, ^\circ\text{C}$	p_{mm}	Wt. % B
NaCl		
0	3.5	26.25
10	6.9	26.30
20	13.2	26.40
30	23.9	26.50
40	41.6	26.65
50	69.5	26.85
60	112.0	27.05
70	175.0	27.30
80	265.2	27.60
90	391.6	27.85
100	564	28.15
108.67	760	28.40
110	795	28.45

NaClO₃; see also p. 370

$t, ^\circ\text{C}$	p_{mm}	C
NaClO₃		
0	3.51	84.4
20	12.8	101.0
40	38.0	122.0
60	95.5	148.0
80	209.4	179
100	411.3	214
110	557.7	233
120	741.4	251
130	968.0	271
255	760.0	

NaOH (7, 8, 107, 141, 265, 283, 284, 316, 383, 430, 433, 434, 452); see further p. 296. Values of p_{mm}

$t, ^\circ\text{C}$	20	40	60	80	100	120	160	200	250	300	350
0	17.539	55.34	149.46	355.47	760.0	1 488.9	4 633	11 647	29 771	64 290	123 660
5	16.9	53.2	143.5	341.5	730	1 430	4 450	11 200	28 600	61 800	118 900
10	16.0	50.6	137	325.5	697	1 365	4 260	10 750	27 500	59 300	114 100
20	13.9	44.2	120.5	288.5	621	1 225	3 860	9 800	25 300	54 700	105 400
30	11.3	36.6	101	246	537	1 070	3 460	8 950	23 300	50 800	98 000
40	8.7	28.7	81	202	450	920	3 090	8 150	21 500	47 200	91 600
50	6.3	20.7	62.5	160.5	368	770	2 690	7 400	19 900	44 100	85 800
60	4.4	15.5	47	124	294	635	2 340	6 750	18 400	41 200	80 700
70	3.0	10.9	34.5	94	231	515	2 030	6 100	17 100	38 700	76 000
80	2.0	7.6	24.5	70.5	179	415	1 740	5 500	15 800	36 300	71 900
90	1.3	5.2	17.5	53	138	330	1 490	5 000	14 700	34 200	68 100
100	0.9	3.6	12.5	38.5	105	262	1 300	4 500	13 650	32 200	64 600
120		1.7	6.3	20.5	61	164	915	3 650	11 800	28 800	58 600
140	C	0°C	3	11	35.5	102	765	2 980	10 300	25 900	53 400
160	0	4.579	1.5	6	20.5	63	470	2 430	8 960	23 300	49 000
180	5	4.4		3.5	12	40	340	1 980	7 830	21 200	45 100
200	10	4.2		2	7	25	245	1 620	6 870	19 200	41 800
250	20	3.6		0.5	2	8	110	985	5 000	15 400	35 000
300	30	2.9		0.1	0.5	2.7	50	610	3 690	12 500	29 800
350	40	2.2				0.9	23	380	2 750	10 300	25 700
400							11	240	2 080	8 600	22 400
500								100	1 210	6 100	17 500
700									440	3 300	11 500
1000										1 470	6 800
2000										150	1 760
4000											120
8000											7

NaCl (12, 13, 56, 57, 73, 76, 106, 108, 109, 121, 205, 233, 286, 384.5, 395, 397, 399, 402, 403, 405, 422, 424), see further p. 297

Values of p_{mm}

$t, ^\circ\text{C}$	0.0	2.5	5	7.5	10	12.5	15.0	17.5	20.0	22.5	25.0	27.5
0	4.579	4.5	4.4	4.4	4.3	4.2	4.1	4.0	3.8	3.7	3.5	
10	9.21	9.1	8.9	8.8	8.6	8.4	8.2	8.0	7.7	7.4	7.1	
20	17.54	17.3	17.0	16.7	16.4	16.1	15.7	15.3	14.8	14.2	13.6	
30	31.83	31.4	30.9	30.4	29.8	29.2	28.5	27.7	26.8	25.8	24.7	
40	55.34	54.5	53.6	52.7	51.7	50.7	49.5	48.1	46.6	44.9	43.0	
50	92.54	91.2	89.7	88.1	86.4	84.7	82.8	80.5	78.1	75.3	72.2	
60	149.46	147.2	144.8	142.3	139.7	136.8	133.7	130.0	126.0	121.7	116.8	
70	233.79	230.2	226.4	222.4	218.3	213.9	208.9	203.5	197.5	190.7	183.1	
80	355.47	350	344	338	332	325	318	309.5	300.5	290.2	278.9	266
90	526.00	517	509	500	491	481	470	458	445.1	430	414	395
100	760.00	748	736	723	710	695	680	665	643	622	599	572
110	1074.5	1057	1040	1022	1003	983	961	936	911	881	849	810
B. P., $^\circ\text{C}$	100.0	100.44	100.90	101.40	101.93	102.51	103.16	103.89	104.72	105.68	106.78	108.12

NaClO₃ (33, 73, 206, 384.5, 433, 434), see further p. 297

Values of p_{mm}

$t, ^\circ\text{C}$	0	20	40	60	80	100
0	4.579	17.539	55.34	149.46	355.47	760.0
5	4.51	17.3	54.6	147.4	350.5	749.4
10	4.45	17.0	53.7	145.1	345.1	737.9
20	4.30	16.5	52.0	140.5	334.2	714.4
40	4.03	15.4	48.7	131.6	313.0	669.1
60	3.78	14.5	45.7	123.4	293.5	627.4
80	3.47	13.6	42.9	115.9	275.7	589.5
100		12.8	40.4	109.2	259.7	555.1
120			38.2	103.1	245.1	524.1

$t, ^\circ\text{C}$	0	20	40	60	80	100
140				97.5	232.0	495.9
160					220.0	470.3
180						447.0
200						425.6

NaBr (73, 333, 334, 384.5, 433, 434), see further p. 297

Values of p_{mm}

$C \backslash t, ^\circ\text{C}$	0	10	20	30	40	50	60	70	80	90	100	110
0	4.579	9.210	17.539	31.834	55.34	92.54	149.46	233.79	355.47	526.00	760.00	1074.5
5.0	4.5	9.1	17.25	31.3	54.4	91.0	147.0	230	349.5	517	747.4	1057
10.0	4.4	8.9	17.0	30.8	53.6	89.7	145.0	226.5	344.5	510	735.5	1041
20.0	4.3	8.6	16.3	29.6	51.5	86.1	139	217.5	331	489	707.2	1000
30.0	4.1	8.2	15.6	28.3	49.1	82.1	132.5	207.5	315.5	467	674.5	954
40.0	3.9	7.8	14.8	26.8	46.6	77.8	125.5	196.5	299	442	639.3	904
50.0	3.6	7.3	13.9	25.3	43.9	73.5	118.5	185.5	282	418	603.3	853
60.0	3.4	6.9	13.1	23.8	41.3	69.1	111.5	174.5	265.5	393	567.6	803
70.0	3.2	6.5	12.3	22.3	38.8	64.9	105	164	249.5	369	530.1	754
80.0		6.1	11.5	21.0	36.4	60.9	98.5	154	234	346	500.1	707
90.0			10.8	19.7	34.2	57.1	92	144	219.5	324.6	469.0	663
100.0					32.0	53.6	86.5	135.5	205.5	304.5	439.9	622
110.0						50.3	81	127	193	285.5	412.7	583
120.0										268	387.4	548
121.9											382.9†	
125.0												531

NaI (73, 433, 434), see further p. 297

Values of p_{mm}

$C \backslash t, ^\circ\text{C}$	0	20	40	60	80	100	120	140
0	4.579	17.539	55.34	149.46	355.47	760.00	1488.9	2709.5
10	4.5	17.1	54.1	146.1	347	743	1455	2648
25	4.3	16.5	52.0	140.6	334.3	715	1400	2548
50	3.9	15.1	47.0	128.3	305.1	652	1278	2326
75	3.5	13.4	42.3	114.3	271.8	581	1138	2072
100	3.0	11.8	37.2	100.5	239.1	511	1001	1822
125	2.7	10.2	32.3	87.2	207.4	443.5	869	1581
150	2.3	8.8	27.9	75.4	179.3	383.5	751	1367
175		7.7	24.2	65.3	155.2	332	650	1183
200			21.0	56.7	134.8	288	565	1028
225				49.5	117.7	251.5	493	897
250				43.5	103.4	221	433	788
275					91.3	195.2	382	696
300						173.3	340	618
325								

$t, ^\circ\text{C}$	p_{mm}	C
100	174.4	303.4
141	760	

Na₂SO₄ (10, 49, 50, 56, 57, 73, 233, 271.5, 304, 381, 384.5, 419, 434, 455, 461), see further p. 297Values of $p_{\text{mm}} \pm 1-4\%$ from 0-100°C

$t, ^\circ\text{C} \backslash \text{Wt. \% B}$	0.0	5.0	10.0	15.0	20.0	25.0	30.0
0.0	4.579	4.50	4.42	4.33	4.22	4.10	
10.0	9.21	9.05	8.88	8.70	8.52	8.25	
20.0	17.54	17.24	16.93	16.60	16.15	15.77	
30.0	31.83	31.34	30.79	30.22	29.54	28.79	27.02*
40.0	55.34	54.5	53.6	52.6	51.5	50.2	48.6
50.0	92.54	91.2	89.8	88.2	86.4	84.4	81.7
60.0	149.46	147.0	145.0	142.7	140.0	136.8	132.6
70.0	233.79	230.5	227.2	223.4	219.4	214.6	208.3
80.0	355.47	351	346	340.4	334.4	327.4	318.1
90.0	526.00	519	512	504	496	486	
100.0	760.00	751	741	730	718	704	

* Supersatd. solution.

Na₂SO₄—(Continued)

$t, ^\circ\text{C}$	p_{mm}	Wt. % B	$t, ^\circ\text{C}$	p_{mm}	Wt. % B
Na ₂ SO ₄ ·10H ₂ O			α -Na ₂ SO ₄		
(15)	12.3	11.78			
(17.5)	14.2	13.83	40	47.4	32.56
20	16.5	16.11	45	62.0	32.17
22.5	19.1	18.60	50	80.4	31.81
25	21.9	21.54	55	103.2	31.48
27.5	24.9	25.07	60	131.2	31.18
30	28.0	29.00	65	165.7	30.87
Na ₂ SO ₄ ·10H ₂ O + α -Na ₂ SO ₄			70	207.2	30.62
32.4	30.8	33.24	75	257.5	30.30
α -Na ₂ SO ₄ + Na ₂ SO ₄ ·7H ₂ O			80	317.4	30.21
24.4m	19.1	34.07	85	386.9	30.04
Na ₂ SO ₄ ·7H ₂ O			90	472.5	29.90
(15)m	11.6	27.25	95	571.7	29.79
(17.5)m	13.1	29.13	100	686.4	29.68
20m	15.1	30.98	102.84	760.0	29.60
22.5m	17.3	32.78	110	974.7	29.54
26.0m	20.6	35.48	120	1 355	29.47
α -Na ₂ SO ₄			130	1 850	29.46
20m	14.4	34.53	140	2 480	29.51
25m	19.6	34.00	150	3 275	29.61
30m	26.8	33.49	160	4 260	29.74
35	35.9	33.00	170	5 465	29.89

Na₂SO₄—(Continued)

<i>t</i> , °C	<i>p</i> _{mm}	Wt. % B
α -Na ₂ SO ₄ + β -Na ₂ SO ₄		
180 ± 20	6 925	30.08
β -Na ₂ SO ₄		
190	8 680	30.43
200	10 750	30.74
210	13 200	31.07
220	16 000	31.38
230	19 350	31.70
β -Na ₂ SO ₄ + γ -Na ₂ SO ₄		
235 ± 5	21 200	31.86
γ -Na ₂ SO ₄		
240	23 250	31.14
260	33 150	28.16
(280)	45 850	24.94
(300)	62 000	21.41
(320)	82 300	17.53

Na₂S₂O₃ (423, 434, 463, 464, 465)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
Na ₂ S ₂ O ₃ ·5H ₂ O		
0	3.95	50.2
10	7.66	59.6
20	14.0	70.0
30	24.0	82.9
40	37.6	103.1

NaNO₃ (10, 56, 57, 73, 106, 120, 121, 243, 286, 384.5, 404, 407, 422, 433, 434), see further p. 297Values of *p*_{mm}

<i>t</i> , °C	0	25	50	75	100	125
<i>C</i>						
0	4.579	23.763	92.54	289.32	760.00	1740.5
5	4.50	23.34	90.9	284.1	746.3	1709
10	4.42	22.93	89.2	278.9	732.5	1677
20	4.28	22.14	86.1	268.8	705.6	1615
30	4.15	21.39	83.1	259.1	679.6	1554
40	4.04	20.69	79.6	249.9	654.8	1496
50	3.93	20.04	77.5	241.1	631.3	1442
60	3.83	19.42	74.9	232.9	609.0	1390
70	3.73	18.83	72.56	225.1	588.1	1341
80	3.64*	18.29	70.25	217.8	568.2	1294
90		17.77	68.1	210.8	549.4	1250
100		17.29*	66.1	204.3	531.6	1209
110			64.2	199.4	514.8	1170
120				192.1	498.9	1135
130				186.5	483.7	1097
140				181.2*	469.4	1064
150					455.7	1032
160					442.6	1002
170					430.1	973
180					418.3*	945
190						919
200						893
210						869
220						846
230						824

* Supersaturated.

Na₂S₂O₃—(Continued)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
Na ₂ S ₂ O ₃ ·5H ₂ O		
43	41.7	113.4
45	43.5	124.0
46	43.9	130.7
47	43.7	139.8
48	41.3	156.0
Na ₂ S ₂ O ₃ ·5H ₂ O + Na ₂ S ₂ O ₃ ·2H ₂ O		
48.15	40.6	159.7
Na ₂ S ₂ O ₃ ·2H ₂ O		
50	43.4	163.5
55	50.8	175.7
60	57.2	191.7
65	60.6	213.8
66	60.8	219.0
Na ₂ S ₂ O ₃ ·2H ₂ O + Na ₂ S ₂ O ₃		
66.45	60.9	221.3
Na ₂ S ₂ O ₃		
70	69.7	223.9
80	99.6	231.6
90	138.2	239.5
100	186.2	248.0

NaNO₂ (301)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
128	761.5	214†

NaNO₃—(Continued)

t , °C	p_{mm}	C	t , °C	p_{mm}	C
NaNO ₃					
0	3.70	73.0	70	148.1	135.6
10	7.20	80.5	80	216.1	148.0
20	13.25	88.2	90	306.7	160.9
25	17.67	92.0	100	422.9	176.0
30	23.27	96.2	110	569.2	192.4
40	39.13	104.8	120	748.5	210.6
50	63.3	113.9	120.59	760.0	211.7
60	98.6	124.0	125	851.6	220.3

Na₂CO₃ (49, 94, 95, 140, 384.5, 423, 433, 434, 457), see further p. 297

Values of $p_{\text{mm}} \pm 1\%$ at 0° to *ca.* $\pm 0.5\%$ at 100°

Wt.% B t , °C	0.0	5.0	10.0	15.00	20.00	25.00	30.00
0.0	4.579	4.5					
10.0	9.210	9.0	8.8				
20.0	17.539	17.2	16.8	16.3			
30.0	31.834	31.2	30.4	29.6	28.8	27.75	26.4*
40.0	55.34	54.2	53.0	51.6	50.2	48.4	46.1
50.0	92.54	90.7	88.7	86.5	84.1	81.2	77.5
60.0	149.46	146.5	143.5	139.9	136.1	131.6	125.7
70.0	239.79	235	230.5	225	219	211.5	202.5
80.0	355.47	348	342	334	325	315	301
90.0	526.00	516	506	494	482	467	447
100.0	760.00	746	731	715	697	676	648

* Supersaturated.

Na₂CO₃—(Continued)

<i>t</i> , °C	<i>p</i> _{mm}	Wt. % B
Na ₂ CO ₃ ·10H ₂ O		
15.0	12.3	14.10
20.0	16.9	17.70
25	21.4	22.15
27.5	24.0	25.00
30	26.8	28.15
31	27.9	29.70
32	28.8	31.35

Na₂CO₃·10H₂O + Na₂CO₃·H₂O

33.10m	29.5	33.30
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Na₂CO₃·H₂O

36.0	34.8	32.95
40	43.6	32.65
45	57.1	32.35
50	74.1	32.10
55	95.4	31.85
60	121.5	31.70
65	153.7	31.60
70	192.7	31.50
75	239.8	31.45
80	296.2	31.40
85	363.4	31.35
90	442.4	31.30
95	535.3	31.25
100	631.7	31.20
110m	915.7	31.10

Na₂CO₃·7H₂O

(20)m	15.3	(24.7)
(25)m	20.3	(27.3)
(30)m	26.2	30.10
34	31.7	32.35
35	33.2	32.95

Na₂CO₃·10H₂O + Na₂CO₃·7H₂O

32.15	29.0	31.50
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Na₂CO₃—(Continued)

<i>t</i> , °C	<i>p</i> _{mm}	Wt. % B
Na ₂ CO ₃ ·H ₂ O + Na ₂ CO ₃ ·7H ₂ O		
35.6	34.0	33.05
Na ₂ CO ₃ ·H ₂ O + Na ₂ CO ₃		
105 ± 5	769.8	31.15

NaCHO₂, Formate (384.5, 434)

<i>C</i>	<i>p</i> _{mm} , 100°C	<i>C</i>	<i>p</i> _{mm} , 100°C
0	760.00	80	490
5	742	100	446
10	723	120	410
20	685	140	379
40	610	157.7†	355
60	545		

NaCH₃COO (141, 146, 434)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
NaC ₂ H ₃ O ₂		
100	319	170 ± 2
123	760	193 ± 5

Na₂C₄H₄O₆, Tartrate (141, 254, 298, 299, 300, 434)

<i>t</i> , °C	<i>p</i> _{mm}	<i>C</i>
Na ₂ C ₄ H ₄ O ₆ ·2H ₂ O		
0.0	4.4	24
5	6.2	28
10	8.6	32
15	11.9	36.5
20	16.2	41
25	21.7	45
30	28.8	50
35	37.9	54
40*	49.3	59
45	63.4	64
50	80.9	69
100	593	130
108 ± 0.5	760.0	146

* Dissociation pressures indicate a probable transition at ca. 40°.

KOH (51, 107, 123, 141, 302, 316, 331, 344, 383, 384.5, 395, 397, 434), see further p. 298

Values of p_{mm}

$t, ^\circ\text{C}$	0	20	40	60	80	100
0	4.579	17.539	55.34	149.46	355.47	760.00
5	4.43	17.0	53.5	144.6	344	735
10	4.25	16.3	51.4	138.9	331	707
20	3.83	14.7	46.4	125.4	299	639
30	3.35	12.9	40.7	110.1	263	563
40	2.82	10.9	34.6	94	225	485
50	2.30	8.9	28.6	78.6	190	413
60	1.82	7.2	23.2	64.6	158	348
80	1.08	4.4	14.6	42.6	108	246
100		2.6	8.8	26.5	70.5	172
120			5.2	16.2	45.5	118
140				9.8	29	81
160						56
178						40†

KOH.—(Continued)

$t, ^\circ\text{C}$	p_{mm}	C
KOH.2H₂O		
0	0.7	97
10	1.2	103
20	1.8	112
25	2.2	
27.5	2.35	
29	2.4	
30	2.4	126
31	2.35	
32	2.25	
KOH.2H₂O + KOH.H₂O		
32.5	2.2	135
KOH.H₂O		
40	3.3	
50	5.5	140
60	9.1	
80	21	
100	40	178

KCl (56, 57, 73, 120, 233, 251, 253, 384.5, 422, 457)

$t, ^\circ\text{C}$	p_{mm}	C
KCl		
20.0	15.5	34.0
25	20.5	35.5
30	26.9	37.0
35	35.1	
40	45.8	40.0
45	62.1	
50	74.8	42.6
55	93.0	
100	567.8	56.1
108.6	760.0	

KClO₃ (73, 141, 179, 187, 304, 384.5, 423, 434)

$t, ^\circ\text{C}$	p_{mm}	C
KClO₃		
0	4.54	3.3
10	9.10	5.1

KClO₃.—(Continued)

$t, ^\circ\text{C}$	p_{mm}	C
KClO₃		
20	17.23	7.4
30	31.07	10.2
35	41.03	11.9
40	53.57	14.0
45	69.23	16.3
50	88.59	18.9
55	112.4	21.6
60	141.3	24.5
65	176.5	27.6
70	217.8	31.1
75	267.3	34.6
80	325.7	38.4
85	393.5	42.6
90	472.4	47.0
95	563.5	51.4
100	668.1	56.1
103.9	760.0	59.9
290	11 700 max.	1×10^3
366	sec. B. P.	3×10^4

KBr (73, 106, 344, 384.5, 434)

$t, ^\circ\text{C}$	p_{mm}	C
KBr		
0	3.95	53.5
100	526.5	105.3

KI (73, 106, 344, 384.5, 434)

$t, ^\circ\text{C}$	p_{mm}	C
KI		
0	3.4	127.5
10	6.6	136
20	12.2	144
30	21.5	152
40	36.5	160
50	59.0	168
60	93.0	176
70	142.0	184
80	210.0	192
90	303	200
100	427	208
118.2	760.0	220

K₂SO₄ (56, 57, 73, 121, 162, 233, 344, 384.5, 433, 434), see further p. 298

Values of p_{mm}

$t, ^\circ\text{C}$	0	30	60	80	100
0	4.579	31.834	149.46	355.47	760.00
0.5	4.573				759.0
1	4.568	31.76	149.1	354.6	758.1
2	4.557	31.68	148.8	353.8	756.4
3	4.548	31.62	148.4	353.0	754.8
4	4.538	31.55	148.1	352.3	753.3
5	4.529	31.49	147.8	351.6	751.8
6	4.520	31.43	147.5	350.9	750.3
8		31.30	147.0	349.6	747.4
10		31.18	146.4	348.2	744.4
15			144.9	344.7	737.0
20				341.2	729.5

K₂SO₄.—(Continued)

$t, ^\circ\text{C}$	p_{mm}	C
K₂SO₄		
0	4.51	7.38
10	8.98	
20	17.04	11.24
25	23.05	
30	30.8	13.08
35	40.7	
40	53.3	14.86
45	69.1	
50	88.8	16.58
60	142.7	18.28
80	340	21.40
100	723	24.19
101.4	760	24.4

KNO₂ (301)

$t, ^\circ\text{C}$	p_{mm}	C
132	758.5	475†

KNO₃ (33, 56, 57, 73, 120, 203, 304, 320, 338, 344, 384.5, 423)

$t, ^\circ\text{C}$	p_{mm}	C
α-KNO₃ (Rhombic)		
-2.82	3.621	11.52
0	4.45	13.3
+10	6.86	20.9
20	16.52	31.6
25	22.10	37.3
30	29.20	45.8
35	38.11	
40	49.09	63.9
45	62.56	
50	78.88	85.5
55	98.53	
60	121.94	110.0
65	149.6	
70	181.8	138
75	219.3	
80	262.2	169
85	311.5	
90	366.9	202
95	429.3	
100	499.0	246
105	576	
110	660	295
115.5	760	330
120	852	365

KNO₃.—(Continued)

$t, ^\circ\text{C}$	p_{mm}	C
α-KNO₃ (Rhombic)		
125	958	415
α-KNO₃ + β-KNO₃		
129U	1048	
α-KNO₃		
130m	1071	
135m	1189	
β-KNO₃ (Rhombohedral)		
120m	837	
125m	950	
β-KNO₃		
130	1074	?
135	1207	
140	1354	
150	1676	
160	2042	
180	2884	
200	3820	
220	4765	
240	5560	
250	5930	
260	5980	
265	5995 max.	
270	5970	
280	5750	
300	4740	
320	2670	
Boiling points		
115.5	760	330
332	760	1×10^5

K₂C₄H₄O₆, Tartrate (141, 167, 254, 298, 299, 300, 434)

t	p_{mm}	C
K₂C₄H₄O₆.2H₂O		
10	7.1	144
15	9.7	150
20	13.1	156
25	17.4	162
30*	23.0	168
35	30.0	174
40	38.8	180
45	49.5	168
100	458	241
115 ± 0.5	760	246

* Reported transition at 29.2° can not be established on basis of existing vapor-pressure data.

K_2CrO_4 (4, 201, 327, 434)		
$t, ^\circ C$	p_{mm}	C
0	4.10	57.2
20	15.4	62.4
40	47.8	67.9
60	126.7	73.9
80	295.8	80.3
100	622.0	86.9
105.9	760.0	88.9

$K_2Cr_2O_7$ (202, 233, 423)		
$t, ^\circ C$	p_{mm}	C
20	17.20	12.2
25	23.20	
30	30.95	18.4
35	40.85	
40	53.30	26.3
45	68.95	
50	88.3	35.3
55	112.0	
60	140.9	45.1
80	323	68.7
100	649	98.5
104.9	760	108

$K_2Cr_2(SO_4)_4$ (241)		
$t, ^\circ C$	p_{mm}	
20	15.0	

$K_2Al_2(SO_4)_4$ (256, 467)		
$t, ^\circ C$	p_{mm}	
60	144.1	
65	179.4	
70	221.3	
75	269.7	
$K_2Al_2(SO_4)_4 \cdot 24H_2O + K_2Al_2(SO_4)_4 \cdot 18H_2O$ (?)		
79.5*	317.3	
$K_2Al_2(SO_4)_4 \cdot 18H_2O$ (?)		
80	321.9	
85	367.0	
90	417.3	

* Other determinations give transition at 84 to 91°.

NON-AQUEOUS SYSTEMS CONTAINING THREE OR MORE COMPONENTS

Standard arrangement, v. p. viii

A = O_2 ; B = S; C = Cu (330)

A = ($O_2 + N_2$), Air; B = CO_2

Critical region (6, 80, 447)

A = SO_2 ; B = $HgBr_2$; C = HgI_2

Data with reference to the elevation of the critical temperature of SO_2 by addition of B and C. Temperature range, 157 to 255°C. No pressure data (287).

$KNaC_4H_4O_6$, Rochelle salt (147, 166, 254, 298, 299, 300)

$t, ^\circ C$	p_{mm}	C
0	4.0	27
10	8.0	40
20	15.2	56
30	27.1	76
40	46.2	106
$KNaC_4H_4O_6 \cdot 4H_2O + Na_2C_4H_4O_6 \cdot 2H_2O$		
41*	48.6	
44	54.3	
46	58.5	
48	62.9	
50	67.6	
52	72.6	
$KNaC_4H_4O_6 \cdot 4H_2O + Na_2C_4H_4O_6 \cdot 2H_2O + K_2C_4H_4O_6 \cdot 2H_2O$		
54	77.9	

* The salt becomes unstable with respect to its own saturated solution at $41 \pm 1^\circ C$. The dissociation pressure curve of the 4-hydrate meets the S-L-V curve at ca. $54^\circ C$. The transition is reported between 54 – 59° ; at this temp. the solution becomes saturated with both $Na_2C_4H_4O_6$ and $K_2C_4H_4O_6$, both present as dihydrates, and the double salt breaks up completely. No data exist on the corresponding ternary system. Solubility data refer to the d-double salt (Seignette's salt).

RbCl (57, 344, 384.5, 434)

RbCl		
20	12.8	91.1
40	38.9	103.5
60	101.5	115.5
80	233.9	127.2
100	484.7	138.9
113.7	760	147

Rb₂SO₄ (57, 384.5, 434)

Rb ₂ SO ₄		
100	673	81.8
103.5	760	83.0

Cs salts (56, 57)

Salt	t at 1 atm.	C^\dagger
CsCl	119.92	290
Cs ₂ SO ₄	109.96	225
CsNO ₃	107.23	221
Cs ₂ Al ₂ (SO ₄) ₄ · 24H ₂ O	100.53	23

A = NH_3 ; B = NH_4NO_3 ; C = NH_4CNS (69, 129, 130, 131, 158, 190, 224)

$t, ^\circ\text{C}$	p_{mm}	M %	
		B	C
NH_4NO_3			
0	102.8	11.7	34.8
0	216.5	20.0	20.0
0	294.5	29.8	10.0
10	122.0	12.8	38.3
10	298.5	21.2	21.2
10	406.5	31.3	10.4
20	384	22.6	22.6
20	546	33.4	11.2
NH_4CNS			
20	173	13.5	40.5
$\text{NH}_4\text{NO}_3 + \text{NH}_4\text{CNS}$			
0	86.5	11.0	37.7
10	122	12.5	39.0
20	167	15.6	39.6

Mole ratio B + C	p_{mm}								
	B/C = 1/3			B/C = 1			B/C = 3		
	0°	10°	20°	0°	10°	20°	0°	10°	20°
0	3221	4612	6429	3221	4612	6429	3221	4612	6429
16	1524								
17	1384			1521					
18	1253			1390			1519		
19	1136			1268			1398		
20	1030	1554		1161			1290		
21	933	1409		1063	1581		1191		
22	846	1284		972	1454		1100		
23	767	1170		888	1330		1015	1512	
24	696	1067	1521	830	1223		932	1400	
25	630	971	1398	740	1122		864	1293	
26	572	886	1285	678	1031	1551	799	1198	
27	520	809	1184	620	948	1434	736	1110	
28	473	739	1090	568	872	1328	680	1029	1553
29	429.5	676	1006	521	803	1231	630	956	1450
30	391.7	619	926	477.5	739	1141	582	888	1353
31	357	568	855	438	685	1058	538	826	1263
32	324.5	521	789	402.5	629	981	498.5	768	1181
33	296.0	479	729	370.5	580	908	462.5	716	1106
34	271	440	673	342	536	836	430	668	1035
35	248.5	405	622	315.5	496	769	400.5	624	971
36	227.8	373	584	290.5	460	709	374	584	909
37	209.5	344	532	269	427	654	349.5	547	853
38	193.0	317	493.5	249.5	397.5	607	328.5	513	801
39	178.1	293	457.5	231.5	371	565	308.5	481	754
40	164.9	270.5	424.5	216.5	347	527		452	709
41	152.4	250	394		325.5	492.5		425.5	668
42	141.3	231	366		306.4	462			630
43	131.2	214	340			435			595
44	122.2	198.6	316			410.5			562
45	116.1	184.7	294.5			388.5			
46	106.4	172.0	275						
47		160.9	258						
48		150.5	242						
49		141.4	227.5						
50	Satd. soln.	133.2	214	Satd. soln.					
51		125.6	202.5						
52			191.6				Satd. soln.		
53			181.8						
54			173.2						

A = NH_3 ; B = CH_4O , Methyl alcohol; C = C_3H_6O , Acetone (102)

A = CO_2 (287, 288, 289, 290, 291, 292, 293, 294)

B =	SiO ₂	SiO ₂	SiO ₂	TiO ₂	TiO ₂	TiO ₂	CaO	CaO
C =	Na ₂ O	K ₂ O	CaO	CaO	Na ₂ O	K ₂ O	Na ₂ O	K ₂ O
D =			Na ₂ O	Na ₂ O				
E =			K ₂ O	K ₂ O				

A = CO₂; B = C₆H₃N₃O₇, Picric acid; C = C₁₀H₈ (139)

<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}	<i>t</i> , °C	<i>p</i> _{atm.}
BC		BC + C		BC + B	
23.4	60.7	28.0	66.0	23.45	60.4
25.9	64.0	29.4	68.1	25.4	62.9
29.1	68.9	31.1	70.7	26.8	65.0
29.5	69.8	31.3	70.9	28.2	67.3
29.9	70.4	31.6	71.4	29.1	68.5
30.6	71.2	31.9	72.0	29.9	69.8
30.9	71.9	32.2	72.4	30.55	70.9
31.1	72.2	32.4	72.6	30.9	71.6
31.3*	72.6	32.6	73.2	31.3	72.3
101.1	212.5	32.8	73.9	31.6*	72.9
102.1	193.6	33.0	74.0	89.5	195.9
103.7	175.4	32.2*	74.3	89.9	184.1
105.9	165.9	54.7	174.8	90.6	164.9
110.6	145.7	54.1	160.0	91.5	150.3
115.2	130.0	54.3	146.6	92.6	135.3
121.7	117.0	55.3	132.0	94.2	120.2
150.7		56.5	121.0	95.5	105.5
BC + C		58.1	107.0	97.6	91.0
22.6	58.4	59.3	94.5	98.9	78.8
24.6	61.0	77.1E		113.4E	
26.5	63.9				

* First critical endpoint; second critical endpoint unrealized. For comparison, crit. pt. CO₂ by same author 31.2°, 72.4 atm.A = CCl₄; B = C₂H₅OH; C = C₆H₆ (377, 378, 379)

Wt. % B					Wt. % B				
Values of <i>p</i> _{mm}					Values of <i>p</i> _{mm}				
34.8° | 50° | 60° | 66°					34.8° | 50° | 60° | 66°				
Wt. Ratio A/C = 23/77					Wt. Ratio A/C = 73.7/26.3				
0	153	281	407	500	30.80	213	410	608	762
2.05	191	353	515	632	43.90	203	393	588	740
8.11	201	380	559	692	56.11	187	370	559	703
17.50	204	390	580	721	66.30	173	343	522	663
26.50	204	392	585	729	80.79	144	297	459	584
40.13	199	385	577	722	94.35	115	244	387	501
50.57	193	376	564	709	100.0	103	223	354	462
59.43	186	363	546	688	Wt. Ratio A/C = 85.2/14.8				
72.23	167	334	508	642	0	170	307	441	541
82.38	148	301	462	589	11.60	221	422	625	777
89.96	130	270	421	542	20.98	219	420	624	778
100.0	103	223	354	462	30.92	215	414	615	769
Wt. Ratio A/C = 55.4/44.6					47.56	199	389	583	733
0	163	295	426	521	59.64	184	361	543	687
2.71	203	380	551	678	70.48	163	325	497	631
5.33	208	391	575	710	84.28	137	280	437	560
12.72	212	406	599	744	100.0	103	223	354	462
22.20	212	408	603	753	Values of <i>p</i> _{mm}				
33.40	208	400	598	746	34.8° | 50° | 60° | 66°				
55.17	190	372	560	703	Wt. Ratio B/A = 23.3/76.7				
70.77	167	335	508	643	0	223	427	637	789
81.02	147	301	465	589	13.25	220	423	628	776
89.25	128	266	417	539	23.45	217	419	617	768
100.0	103	223	354	462	37.0	213	407	602	751
Wt. Ratio A/C = 73.7/26.3					50.63	209	397	589	731
0	166	303	435	533	66.91	201	383	566	700
2.48	207	387	561	687	79.49	194	366	535	661
6.10	215	408	600	744	89.70	182	338	490	600
12.01	218	414	612	763	95.29	170	308	446	546
22.81	216	414	615	767	100.0	147	271	389	477

A = CCl₄; B = C₂H₅OH; C = C₆H₆.—(Continued)

Wt. % C	Values of p_{mm}				Wt. % C	Values of p_{mm}			
	34.8°	50°	60°	66°		34.8°	50°	60°	66°
Wt. Ratio B/A = 56.13/43.87									
0	187	369	554	700	62.59	203	391	583	724
7.2	194	381	571	721	75.69	200	385	570	708
13.16	199	388	581	729	84.87	194	373	548	681
19.77	202	392	586	735	94.04	185	349	509	625
30.42	205	395	589	738	97.19	172	317	457	562
43.75	205	395	589	738	100.0	147	271	389	477

A = CHCl₃, Chloroform; B = C₄H₁₀O, Ethyl ether; C₁ = C₆H₃N₃O₇, Picric acid, C₂ = C₅H₉NO, Acetanilide, C₃ = C₁₀H₈, Naphthalene (275); cf. (115, 116, 150, 195, 409)Values of *p*_{mm}

<i>x</i> _A in A + B		A + B saturated with			
		Nil, 13.60°	C ₁ , 12.75°	C ₂ , 12.20°	C ₃ , 12.35°
0		341	327	319	272
10		305	293	283	243.5
20		267	255	247.5	214.5
30		228	218.5	211	186
40		193	185	177.5	157
50		163	156	150	132.5
60		140	134	129.5	115
70		127	122.5	117.5	104
80		122	120	113	96.5
90		122	119	112.5	91.5
100		126.2	121	115.5	92

A = CS₂; B = C₃H₆O, Acetone; C₁ = C₆H₃N₃O₇, Picric acid, C₂ = C₅H₉NO, Acetanilide (275); cf. (342, 466)Values of *p*_{mm}

<i>x</i> _A in A + B		A + B saturated with		
		Nil, 24.8°	C ₁ , 24.6°	C ₂ , 24.8°
0		231.5	170.5	208.5
10		321	250	280
20		379	324	331
30		414	375	368
40		435	406	398
50		448	423	415
60		453	429	422
70		455	431	426
80		453	432	428
90		439	420	419
100		358	357	358

A = CS₂; B = C₃H₅O₂, Methylal; C₁ = C₆H₃N₃O₇, Picric acid, C₂ = C₁₀H₈, Naphthalene (275); cf. (466)

<i>x</i> _A in A + B		A + B saturated with		
		Nil, 16.53°	C ₁ , 18.10°	C ₂ , 18.60°
0		265.5	236	252
10		292	278	267
20		313	309	280
30		329	332	289
40		338	346	294
50		341	353	295.5
60		340.5	355	293
70		335	355.5	286
80		325	350	273
90		304	327	253
100		263	275.5	126.5

A = CS₂; B = C₄H₁₀O, Ethyl ether; C₁ = C₆H₃N₃O₇, Picric acid, C₂ = C₁₀H₈, Naphthalene, C₃ = C₁₀H₁₆O, Camphor (275)Values of *p*_{mm}

<i>x</i> _A in A + B		A + B saturated with				<i>x</i> _A in A + B		A + B saturated with			
		Nil, 20.5°	C ₁ , 18.2°	C ₂ , 22.2°	C ₃ , 20.3°			Nil, 20.5°	C ₁ , 18.2°	C ₂ , 22.2°	C ₃ , 20.3°
0		449	404	381	173	60		424	382	339	217
10		452	407	379	181	70		409	368	326	222
20		453	408	374	189	80		385	349	311	227
30		450	406	368	196	90		350	321	293	232
40		444	402	360	204	100		307	277	273	237
50		436	393	350	211						

SYSTEMS CONTAINING THREE OR MORE COMPONENTS—AQUEOUS

Standard Arrangement, v. p. viii

B = HCl; C = Cu₂Cl₂ (462)

p_{mm}	$\frac{\text{g C}}{100 \text{ g A}}$	p_{mm}	$\frac{\text{g C}}{100 \text{ g A}}$	p_{mm}	$\frac{\text{g C}}{100 \text{ g A}}$
$\text{g B}/100 \text{ g A} = 22.4$		$\text{g B}/100 \text{ g A} = 27.6$		$\text{g B}/100 \text{ g A} = 31.1$	
$t = \text{ca. } 52^\circ$		70	13.8	133	29.0
55	0	66	27.6	131	33.6
55	6.9	64	34.7	126	41.5
55	12.8	64	37.4	$\text{g B}/100 \text{ g A} = 32$ $t = \text{ca. } 91^\circ$	
55	25.5	61	40.8		
55	37.9	$\text{g B}/100 \text{ g A} = 31.1$ $t = \text{ca. } 85^\circ$			
55	43.6				
$\text{g B}/100 \text{ g A} = 27.6$		150	0	192	0
$t = \text{ca. } 65^\circ$		146	0	187	7.35
75.5	0	146	7.2	180	14.7
73	6.9	142	14.7	173	22.2
		138	21.8	166	29.4

B = HCl; C = LiCl (462)

<i>p</i> _{mm}	g C/100 g A	<i>p</i> _{mm}	g C/100 g A	<i>p</i> _{mm}	g C/100 g A
g B/100 g A = 7.4 <i>t</i> = ca. 52°					
87	0	57	10.4	121	22.9
80.5	5.07	61	15.6	191.5	28.2
76.5	9.18	75	25.9	767	46.3
63.5	18.4	156	38.9	1490	
51	27.6	395	52.3	g B/100 g A = 28 <i>t</i> = ca. 65°	
49.5	34.2	820	64.5		
49.5	39.0	1500	79.5	g B/100 g A = 22.4 <i>t</i> = ca. 52°	
68	51.0	79	0		
312	76.0	122	5.9	186	11.8
g B/100 g A = 18.2 <i>t</i> = ca. 52°					
67.5	0	55.5	0	312	17.6
59	5.2	57	5.5	648	26.0
		65	10.9	992	30.4
		78.5	16.6	1344	36.8

B = I₂; C = HI (427)

B = H₂SO₄; C = As₂O₃ (384)
*p*_{As₂O₃} = ca. 0.00001 mm
 from a 0.015% As₂O₃ solution
 in H₂SO₄ (sp. gr. = 1.84) at
 60°C.

B = NH₃; C = NH₄NO₃ (100)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
18.82 Wt. % B; 33.7 Wt. % C			
-12.95	53.2	10.95	188.0
-7.25	73.5	18.8	272.5
+0.10	109.0	27.72	405.0
7.98	159.5	35.2	555.7

B = NH₃; C = NH₄Cl (310)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
16.85 Wt. % B; 12.90 Wt. % B; 5.27 Wt. % C 10.26 Wt. % C			
19.01	182.1	23.1	158.5
26.0	251.1	30.9	230.5
32.9	343	38.3	319
39.2	449	45.4	429
49.3	667	51.2	543
57.8	913	58.1	708

B = NH₃; C = C₂H₆O, Ethyl
alcohol (102)B = NH₃; C = C₆H₁₄O₆,
Mannitol (310)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
12.27 Wt. % B; 4.56 Wt. % C			
22.9	143.8	42.7	349
29.8	197.7	50.6	479
36.8	271	57.8	630

B = NH₃; C = CH₄N₂O, Urea
(145, 310)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
16.36 Wt. % B; 17.22 Wt. % B; 10.43 Wt. % C 5.29 Wt. % C			
24.5	254.4	25.1	260.4
29.4	312	29.6	317
35.2	403	35.0	400
40.4	497	39.7	485
45.6	611	45.9	622
54.4	856	50.1	726
59.1	1014	54.5	857
		58.0	974

B = NH₃; C = NH₄CNS
(100, 129)Wt. % B | *p*_{mm} || Wt. % B | *p*_{mm}Wt. ratio A/C = 1
10°C | 30°C

16.64	97	16.67	252
23.24	177	20.98	371
30.44	344	25.34	550
35.90	554	29.20	755
39.68	766	32.02	956
42.98	978	34.52	1167
45.64	1175	36.72	1381
47.84	1358	38.10	1530
49.74	1526		

t = 20°C
Wt. ratio A/C = 10/3

9.37	64	34.52	757
14.89	137	37.47	950
20.63	235	40.33	1168
26.58	395	42.67	1368
30.90	565	44.62	1550

Wt. ratio A/C = 7/6

8.47	66	36.76	928
13.10	107	38.99	1107
19.24	198	41.13	1291
26.71	394	42.83	1451
31.44	593	43.89	1559
34.55	773		

Wt. ratio A/C = 1/2

9.53	77	34.63	775
16.79	154	37.61	970
22.78	270	40.2	1188
28.37	447	42.11	1370
31.83	614		

Wt. ratio A/C = 1/6.335

17.51	159	36.20	898
22.74	268	37.91	1031
27.51	421	39.15	1136
30.69	564	40.56	1266
32.43	667	41.65	1377
34.09	769	42.51	1463

0.1865 g NH₄CNS per cm³ of
22.16% NH₃ solution

<i>t</i> , °C	<i>p</i> _{mm}
-15.3	39.6
-8.03	62.0
-0.81	94.5
+6.78	143.9
10.16	170.8
17.19	237.6
23.0	314.1
30.3	433.1
35.7	543.1

B = NH₃; C = CuSO₄ (310)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
14.65 Wt. % B; 6.54 Wt. % B; 2.68 Wt. % C 3.94 Wt. % C			
18.9	138.5	30.6	91.8
26.4	197.6	37.0	126.2
36.1	307	41.5	155.1
43.6	422	46.9	194.7
47.5	493	52.6	250.1
50.8	560	57.7	309
56.5	693		

B = NH₃; C = CaCl₂ (100)*t*, °C | *p*_{mm} || *t*, °C | *p*_{mm}

22.9 Wt. % B; 12.9 Wt. % C			
-13.4	54.0	16.4	272.6
-5.0	88.6	23.1	370.1
+1.8	129.8	29.8	498.2
2.5	136.5	35.6	640.3
9.3	193.1		

B = NH₃; C = Ca(NO₃)₂ (100)*t*, °C | *p*_{mm} || *t*, °C | *p*_{mm}

19.18 Wt. % B; 25.77 Wt. % B; 22.48 Wt. % C 55.8 Wt. % C			
-14.5	34.8	-12.1	82.6
-9.3	48.1	-4.9	124.1
-2.2	73.2	+3.97	202.3
+5.3	110.2	11.0	291.1
15.1	181.7	18.0	413.0
21.2	242.0	25.0	575.3
29.5	354.0	32.4	782.7
36.4	474.0		

B = NH₃; C = LiNO₃ (100)*t*, °C | *p*_{mm} || *t*, °C | *p*_{mm}

18.0 Wt. % B; 21.5 Wt. % B; 45.7 Wt. % C 42.2 Wt. % C			
-13.5	16.7	-14.9	24.5
-12.2	19.6	-7.0	41.6
-4.2	31.9	0.0	63.8
+1.7	46.3	+7.0	95.3
8.5	66.8	14.0	136.4
14.4	91.1	20.4	188.4
21.6	131.0	27.1	257.0
28.7	183.2	35.2	371.1
35.2	246.9		

23.3 Wt. % B; 26.2 Wt. % B;
18.0 Wt. % C 30.1 Wt. % C

-14.5	50.8	-15.4	52.9
-8.1	73.7	-7.8	84.4
+0.8	110.2	-0.1	131.8
6.5	161.9	+8.4	203.1
13.4	225.2	15.2	283.4
20.0	308.0	21.0	369.7
28.0	441.8	27.5	491.5
35.1	598.1	35.1	683.1

38.4 Wt. % B; 55.5 Wt. % C

-11.6	121.3	15.4	493.0
-5.5	169.6	20.5	623.8
+1.0	242.1	27.6	862.7
8.2	345.4	34.4	1141

B = NH₃; C = NaI (100)*t*, °C | *p*_{mm} || *t*, °C | *p*_{mm}

16.06 Wt. % B; 26.9 Wt. % B; 32.34 Wt. % C 64.9 Wt. % C			
-14.4	40.9	-14.6	87.5
-8.0	61.1	-13.0	96.6
+1.2	90.4	-9.6	120.3
3.15	116.3	-8.0	143.0
10.7	170.8	-0.9	190.3
17.9	242.4	+6.0	276.0
25.8	347.5	13.1	394.8
35.0	519.2	20.1	551.8
		26.9	753.8

B = NH₃; C = Na₂SO₄ (310)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
16.73 Wt. % B; 4.23 Wt. % C		15.44 Wt. % B; 4.53 Wt. % C	
27.6	321.1	25.8	215.3
31.1	364.0	28.7	238.8
33.0	395.0	30.9	261.2
35.2	435.2	33.1	288.7
37.0	472	34.7	307.3
38.5	485.2	37.3	342.7
39.1	497.3	39.4	374.9
40.3	523.3	42.7	429.8
42.0	550.4	45.0	468.6
43.0	580.9	46.2	491.6
44.7	619.3		
46.5	666.5		
9.90 Wt. % B; 4.25 Wt. % C			
29.1	167.7	37.9	246.0
31.1	183.5	40.1	271.6
33.4	202.8	43.1	310.4
34.8	215.9	46.2	352.8
36.5	232.4		

B = NH₄Cl; C = KNO₃ (120, 384.5)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
19	11.99	25	16.92
20	12.73	26	17.82
21	13.51	27	18.80
22	14.31	28	19.77
23	15.15	29	20.78
24	16.03	30	21.83

B = CO₂; C = MgO (53, 122, 155, 182)

$t = 18^{\circ}\text{C}$				$t, ^{\circ}\text{C}$	$\text{MgCO}_3,$ g/l
p_{CO_2} atm.	$\text{MgCO}_3,$ g/l	p_{CO_2} atm.	$\text{MgCO}_3,$ g/l		
$\text{Mg}(\text{OH})_2$		$\text{MgCO}_3 \cdot 3\text{H}_2\text{O}$		$p_{\text{CO}_2} = 1 \text{ atm.}$	
0.0000	0.0126	2.5	35.4	3.5	35.6
0.0002	1.63	3.0	38.1	12	26.5
0.00025	1.87	3.5	40.4	18	22.1
0.00030	2.10	4.0	42.6	30	15.8
0.00035	2.31	4.5	44.3	40	11.8
$\text{Mg}(\text{OH})_2 +$		5.0	46.0	50	9.5
$\text{MgCO}_3 \cdot 3\text{H}_2\text{O}$		6.0	49.3	$p_{\text{CO}_2} = 5 \text{ atm.}$	
0.00037	2.39	7.0	52.5	10	35.7
$\text{MgCO}_3 \cdot 3\text{H}_2\text{O}$		8.0	55.1	15	32.8
0.0004	2.42	9.0	57.2	40	13.7
0.00045	2.47	10.0	59.2	$p_{\text{CO}_2} = 34 \text{ atm.}$	
0.0005	2.51	16.0	70.5	0	85.8
0.001	3.11	$\text{MgCO}_3 \cdot 3\text{H}_2\text{O} +$		5	83.2
0.01	6.04	$\text{Mg}(\text{HCO}_3)_2$		10	79.3
0.1	12.2	18.2	74.9	18	74
0.5	20.6	$\text{Mg}(\text{HCO}_3)_2$		30	68.8
1.0	25.8	35.0	74.9	40	64.4
1.5	29.8	56.0	74.9	50	61.8
2.0	32.9			60	55.6

B = CO₂; C = SrO, *t* = 18°C (156)

<i>p</i> _{CO₂} , atm.	SrCO ₃ , g/l	<i>p</i> _{CO₂} , atm.	BaCO ₃ , g/l
SrCO ₃		BaCO ₃	
1	1.2	1	2.7
Sr(HCO ₃) ₂		Ba(HCO ₃) ₂	
>35	3.8	25.0	5.9

B = NH₃; C = K₂SO₄ (310)

<i>t</i> , °C	<i>p</i> _{mm}	<i>t</i> , °C	<i>p</i> _{mm}
7.49 Wt. % B; 3.05 Wt. % C			
40.4	203.5	51.1	320.0
46.7	265.2	58.5	428

B = NH₄NO₃; C = NaNO₃ (279, 320, 384.5)

NH ₄ NO ₃ + NaNO ₃ crystals			
10	5.4	30	14.6
15	7.0	35	18.5
20	9.0	38	21.4
25	11.6	40*	31.2

* Unsaturated solution containing 68.4 g NaNO₃ and 150.4 g NH₄NO₃ per 100 g H₂O.

B = CO₂; C = Heavy-metal oxides at 18°C (156)

Oxide	Carbonate, g/l	
	<i>p</i> _{CO₂} , 1 atm.	<i>p</i> _{CO₂} , 56 atm.
PbO.....	0.14	0.15
ZnO.....	0.7	0.84
CuO.....	0.3	0.41
Ag ₂ O....	1.05	1.7
MnO....	0.4	0.8
FeO.....	0.72	0.77

B = CO₂; C = CaO (122, 154, 182, 183, 255, 365, 366)

$t = 16-18^{\circ}\text{C}$				$t, ^{\circ}\text{C}$	$\text{CaCO}_3,$ mg/l
p_{CO_2} atm.	$\text{CaCO}_3,$ mg/l	p_{CO_2} atm.	$\text{CaCO}_3,$ mg/l		
Ca(OH)_2		CaCO_3		$p_{\text{CO}_2} = 56 \text{ atm.}$	
3.16×10^{-14}	2000	0.142	537	18	3930
$\text{Ca(OH)}_2 + \text{CaCO}_3$		0.254	668	25	4030
2.6×10^{-14}	2000	0.417	793	35	3800
CaCO_3		0.553	892	45	3390
2.80×10^{-10}	74	0.730	979	55	2550
9.78×10^{-9}	26	0.984	1094	$p_{\text{CO}_2} = 3.2 \times 10^{-4} \text{ atm.}$	
6.14×10^{-8}	18	1.0	1110	0	81
2.19×10^{-7}	16	2	1400	5	75
3.73×10^{-7}	15.9	4	1820	10	70
3.85×10^{-7}	15.9	6	2110	15	65
6.07×10^{-7}	16	10	2500	20	60
7.62×10^{-6}	22	14	2830	25	56
7.63×10^{-6}	40	18	3070	30	52
2.15×10^{-4}	56	25	3420		
5.04×10^{-4}	75.1	35	3890		
8.08×10^{-4}	85.6	$\text{CaCO}_3 +$			
3.33×10^{-3}	138.2	$\text{Ca(HCO}_3)_2$			
1.39×10^{-2}	224.7	36.5	3930		
2.82×10^{-2}	298.6	$\text{Ca(HCO}_3)_2$			
5.01×10^{-2}	362.5	56	3930		

B = C₆H₆, Benzene; C = C₂H₆O, Ethyl alcohol (42, 43)
760 mm isobar; see also p. 316

<i>t</i> , °C	Wt. % L _I			Wt. % L _{II}		
	A	B	C	A	B	C
69.0	0.3	0.04	99.66	97.0	2.7	0.3
68.0	0.3	0.4	99.3	92.8	6.8	0.4
67.0	0.4	1.2	98.4	88.1	11.4	0.5
66.0	0.5	2.8	96.7	81.8	17.6	0.6
65.5	0.7	5.2	94.1	77.3	22.0	0.7
65.0	1.0	9.1	89.9	65.6	32.4	2.0

B = C₂H₆O, Ethyl alcohol; C = C₄H₁₀O, Ethyl ether, see also Fig. 16 (104, 249, 296)

L + V, 0° isotherm, values of *p*_{mm}

Wt. % C	Wt. % B in A + B									
	94.7	89.9	79.5	69.9	57.5	47.3	37.9	29.0	20.5	10.5
2				20.5	25.0		30.5		52	
4				29.5	39.5	47.0	52.5	61.0	91.5	60.5
6		32.0	33.0	37.2	52.0	62.0	71.0	86.5	124.0	91.0
8		38.0	39.8	45.0	63.5	75.0	87.0	109.0	146.5	126.5
10		44.5	46.5	52.5	73.0	87.0	100.5	129.5	159.0	170.0
12		50.5	53.0	59.8	81.5	96.5	112.5	144.0		
15	58.0	59.0	62.5	70.2	92.5	109.0	127.5	156.5		
20	71.5	72.5	77.0	86.0	107.5	125.5	145.5			
25	83.5	85.0	90.2	100.0	121.0	138.5	154.0			
30	95.0	96.3	101.8	112.0	132.0	148.5	159.0			
35	104.5	106.3	111.7	122.5	140.5	154.5				
40	113.0	115.0	121.0	131.5	148.0	158.5				
50	128.5	129.5	136.6	145.0	157.5					
60	141.5	142.7	148.8	155.5						
70	153.0	154.3	159.3	163.0						
80	162.0	163.3	167.3	169.0						
90	172.0	173.0	175.0	176.0						

Wt. % L _I			Wt. % L _{II}			<i>p</i> _{mm}
A	B	C	A	B	C	
88.4	0	11.6	1.0	0	99.0	187.5
81.0	8.4	10.6	1.3	2.7	96.0	184.0
80.1	9.4	10.5				183.0
74.0	15.5	10.5	3.5	7.3	89.2	175.0
70.4	18.1	11.5				168.0
68.5	20.0	11.5	6.6	13.6	79.8	166.5

Continued on p. 378

B = C₂H₆O; C = C₄H₁₀O.—(Continued)Isotherms, values of p_{mm}

Wt. %			−20°	−10°	0°	+5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
A	B	C													
4.5	85.5	10	16	27	46	59	76	96	120						
4.0	76.0	20	26	44	70		110		170						
3.0	57.0	40	35	60	100	128	164	207	262						
2.0	38.0	60	48	80	131	166	210	264	327						
1.67	31.67	66.67			149	187	234	288	353	430	522	628	750	892	1053
1.43	27.14	71.43			155	195	244	300	366	446	541	651	777	924	1092
1.0	19.0	80	60	98	157	197	247	306	376						
3.3	30.0	66.7			150	189	236	292	359	435	530	636	760	903	1066
5.0	28.3	66.7			152	193	239	295	363	443	537	645	771	916	1082
6.6	26.7	66.7			155	194	243	300	368	447	543	654	780	929	1095
10.0	23.3	66.7			158	199	248	308	376	457	555	668	798	949	1120
13.3	20.0	66.7	} 2 liq. phases {		165	207	259	320	392	476	577	695	829	984	1162
20.0	13.3	66.7			174	217	269	332	408	495	600	722	861	1022	1206
26.6	6.7	66.7			181	227	283	349	426	517	628	754	902	1069	1262
2.85	25.71	71.43			157	197	246	304	370	453	547	659	789	936	1106
4.29	24.28	71.43			160	200	249	306	374	457	554	666	796	946	1116
5.71	22.85	71.43			161	201	251	309	379	462	560	673	804	956	1129
8.57	20.0	71.43			164	205	255	316	387	473	574	690	823	977	1155
11.42	17.14	71.43	} 2 liq. phases {		167	211	262	323	396	482	586	705	839	998	1179
17.14	11.42	71.43			175	218	272	336	412	501	607	730	870	1034	1221
22.85	5.71	71.43			182	227	283	350	429	521	632	757	903	1072	1264

B = C₂H₆O; C = C₄H₁₀O.—(Continued from p. 377)

Wt. % L _I			Wt. % L _{II}			p_{mm}
A	B	C	A	B	C	
60.2	23.4	16.4	14.2	22.0	63.8	161.0
			17.8	24.2	58.0	161.0
59.0	24.0	17.0				160.5
55.0	25.1	19.9	19.0	24.5	56.5	159.0
43.8	26.7	29.5				158.5
30.6	27.4	42.0				158.5

B = C₂H₆O, Ethyl alcohol; C = C₄H₁₀O, Ethyl ether; D = C₁₂H₁₁N, Diphenylamine (249)
Values of p_{mm}

$t, ^\circ\text{C}$	3.3 % A			3.3 % A			3.3 % A		
	63.3 % B			63.3 % B			63.3 % B		
	33.3 % C			33.2 % C			33.1 % C		
	0 % D			0.1 % D			0.2 % D		
0	102.2			100.1			99.3		
5	127.4			124.5					
10	159			155.7			155.5		
15	196			194			192		
20	241			238			236		
25	293			290			288		
30	358			353			352		
35	431			427			425		
40	518			517			514		
45	621			614			612		
50	738			731			729		

B = C₂H₆O, Ethyl alcohol; C = Na₂CO₃ (191, 203)

$t, ^\circ\text{C}$	p_{mm}	Wt. % Li			Wt. % LiI		
		A	B	C	A	B	C
$\text{Na}_2\text{CO}_3 \cdot 7\text{H}_2\text{O} + \text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$							
34.6	87.5	36.4	63.3	0.3	66.5	1.0	32.5
$\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$							
36.0	94.5	37.7	62.0	0.3	66.8	1.1	32.1
40.0	117.0	38.6	61.0	0.4	66.9	1.2	31.9
49	186	38.6	61.0	0.4	67.3	1.2	31.5
68	442	43.3	55.8	0.9	68.9	2.3	28.8

B = C₂H₆O; C = Na₂CO₃.—(Continued)

$t, ^\circ\text{C}$	45	50	55	60	65	70	75	80	81.6
p_{mm}	151.5	195	249	313	390	482	601	719	760

‡ S + L_I + L_{II} + V; S = Na₂CO₃·H₂O.B = C₃H₆O, Acetone; C = C₆H₆O, Phenol (370, 373, 374, 375, 376), see also Figs. 17 and 18

Conjugate solutions

$t, ^\circ\text{C}$	p_{mm}	L _I		L _{II}	
		Wt. % A	Wt. % B	Wt. % A	Wt. % B
50.0	92	88	0	37	0
	100	89.3	0.2	30.6	4.2
	150	89.9	4.2	21.0	21.0
	200	85.6	9.5	22.3	30.2
	250	80.2	14.4	25.8	37.9
	300	60.8	27.7	36.9	38.4
	310*	47.7	34.3	47.7	34.3
56.5	126	85.5	0	40	0
	150	87.9	0.5	29.4	6.6
	200	89.2	3.4	23.0	18.5
	250	84.2	10.0	21.8	27.6
	300	81.2	12.7	24	33.4
	350	72.4	19.5	29.4	37.4
	375	64.3	24.8	35.3	37.6
68.0	386*	47.5	33.5	47.5	33.5
	220	73	0	60	0
	250	81.4	0.6	34.6	6.4
	300	86.4	1.6	28.0	14.7
	350	87.0	4.6	26.1	20.6
	400	83.7	8.8	25.4	26.0
	450	81.0	11.2	26.5	30.4
75.0	500	74	16.6	29.8	33.6
	550	63.7	23.1	37.9	33.4
	570*	50.6	29.4	50.6	29.4
	315*	64.6	1.4	64.6	1.4
	350	78.6	1.4	34.5	9.5
	400	83.9	2.1	31.4	14.0
	450	85.4	5.6	29.2	22.2
500		84.0	7.6	30.1	26.9

$t, ^\circ\text{C}$	p_{mm}	L_I		L_{II}	
		Wt. % A	Wt. % B	Wt. % A	Wt. % B
75.0	550	81.2	10.0	33.2	29.8
	600	75.9	14.1	39	30.2
	650	68.3	18.9	47.4	28.1
	685*	54.5	25.5	54.5	25.5
85.0	510*	61	5.0	61	5
	550	76.6	5.4	42.8	9.2
	600	79.5	5.9	39.1	12.9
	650	79.9	7.3	37.4	17.0
	700	78.6	9.0	37.4	20.5
	750	75.9	11.4	39.8	22.8
	800	72.6	13.6	45.2	23.1
90.0	850	63.8	18.0	53.9	21.2
	857*	60.9	19.1	60.9	19.1
	684*	59.6	8.4	59.6	8.4
	700	65.9	9.1	51.9	10.1
	750	69.3	9.7	48.1	12.5
	800	69.4	10.6	49.5	16.0

* Critical solution pressure.

$t, ^\circ\text{C}$	p_{mm}	L_I		L_{II}	
		Wt. % A	Wt. % B	Wt. % A	Wt. % B
90.0	850	67.7	12.3	55.7	15.3
	875*	63.5	13.5	63.5	13.5
92	825*	58.9	11.5	58.9	11.5

Wt. % composition and vapor pressure of the three coexistent phases ($L_I + L_{II} + V$) at 56.5°C

p_{mm}	L_I		L_{II}		Vapor	
	A	B	A	B	A	B
126	85.5	0	40	0	92.2	0
180	89.0	3.5	24	16.5	72.2	25.4
220	88.5	5.5	22.5	23.5	55.9	43
260	85.2	8.8	23	29	28.1	71.2
300	80.3	13.5	25	32.5		
324					22.6	77
350	72.5	19.5	29.5	37		
380	59.3	27.7	37	37		
386*	48	33	48	33		

* Critical solution pressure.

Vapor pressure isotherms on the $L_I + L_{II}$ boundary

Wt. ratio A/B	50°		56.5°		68°		75°		85°		90°		92°
	Wt. % C	p_{mm}	Wt. % C	p_{mm}	Wt. % C	p_{mm}	Wt. % C	p_{mm}	Wt. % C	p_{mm}	Wt. % C	p_{mm}	
100.0/0.00	12	92	14.5	126	27	220							Critical solution point Wt. % A = 58.9 Wt. % B = 11.5 Wt. % C = 29.6 $p = 825$
	63		60.0		40								
91.96/8.04	5.0	179	6.0	236	7.8	370	8.8	481	13.0	638			
	64.8	98	63.2	136	56.8	232	52.1	321	38.0	513			
84.4/15.6	5.4	245	6.5	315	8.4	475	9.9	602	13.7	798	20.2	855	
	65.5	103	63.8	141	58.8	245	55.6	340	47.2	537	37.5	699	
77.48/22.52	7.5	281	8.5	358	11.0	529	13.4	655	18.8	853	30.5	837	
	65.3	109	63.9	149	59.0	260	56	363	48.4	577	39.0	755	
68.18/31.82	11.8	301	13.0	382	15.6	562	20.1	673	29.3	822			
	64.0	115	62.4	160	58.0	287	54.3	405	45.4	654			
49.83/50.17	24	302	25.9	379	32.0	531							
	58	151	56.6	212	49.0	396							

Point of max. pressure on the $L_I + L_{II}$ surface $90.5 \pm 0.5^\circ\text{C}$, $p = 885$ mm, Wt. % A = 63, B = 14.5, C = 22.5.B = $\text{C}_3\text{H}_6\text{O}_2$, Methyl acetate; C = $\text{C}_{12}\text{H}_{22}\text{O}_{11}$, Sucrose, at 25 and 35°C (257)B = $\text{C}_3\text{H}_8\text{O}_3$, Glycerol; C = NaCl (83)

Solutions saturated with NaCl, boiling points, °C

Wt. % B in A	p_{mm} ; see also p. 316					
	92.5	149.5	233.7	355.4	525.9	760.0
0	56.6	66.8	77.3	87.7	98.2	108.7
10	56.1	66.6	77.3	87.9	98.5	109.1
20	57	67.6	78.1	88.7	99.2	109.8
30	58.2	68.8	79.3	89.9	100.5	111.1
40	59.4	70.0	80.6	91.2	101.8	112.5
50	60.6	71.3	82.0	92.8	103.5	114.2
60	62.6	73.4	84.2	95.0	106.0	116.8
70	65.6	76.7	87.7	98.7	109.8	120.9
80	71.7	83.1	94.5	106.0	117.6	129.0
90	87.2	98.9	111.6	124.4	137.1	149.8
95.64	105.8	120.5	135.2	149.9	164.7	179.3

B = $\text{C}_6\text{H}_6\text{O}$, Phenol; C = $\text{C}_6\text{H}_7\text{N}$, Aniline (368, 369, 371)

Wt. % L_I , 56.3°C			Wt. % L_{II} , 56.3°C			Wt. % V, 56.3°C		
A	B	C	A	B	C	A	B	C
40	60	0	85.5	14.5	0	92.2*	7.83*	0*
26.5	65	8.5	92.5	6.6	0.9	90.6	6.05	3.4
17.1	62.2	20.7	93.7	4.7	1.6	88.9	4.89	6.2
15.4	53.3	31.3	94.6	3.4	2.0	87.4	3.81	8.8
11.1	44.6	44.3	95.0	2.6	2.4	86.7	2.26	11.0
5.5	0	94.5	95.7	0	4.3	84.5	0	15.5

* $p = 126$ mm.B = $\text{C}_{12}\text{H}_{22}\text{O}_{11}$, Sucrose; C = NaCl, $t = 25^\circ\text{C}$ (367) M_C^* | M_B^* | $p_{\text{H}_2\text{O}}/p$

6.22	0.40	1.338
6.23	0.58	1.340
6.33	1.03	1.349
6.33	1.18	1.352
6.54	2.34	1.388
6.63	2.82	1.405

 $\text{C}_{12}\text{H}_{22}\text{O}_{11}$

0.855	6.18	1.1721
0.92	5.95	1.194
1.74	5.97	1.197
1.74	5.90	1.226
2.83	5.92	1.274
3.40	5.97	1.304
3.41	5.98	1.306

 $\text{C}_{12}\text{H}_{22}\text{O}_{11} \cdot \text{NaCl} \cdot 2\text{H}_2\text{O}$

5.02	5.01	1.304
5.16	4.75	1.304
5.98	3.51	1.323
6.49	3.17	1.382

 $\text{C}_{12}\text{H}_{22}\text{O}_{11} + \text{C}_{12}\text{H}_{22}\text{O}_{11} \cdot \text{NaCl} \cdot 2\text{H}_2\text{O}$

5.04	6.23	1.404
------	------	-------

 M_C^* | M_B^* | $p_{\text{H}_2\text{O}}/p$

NaCl + $\text{C}_{12}\text{H}_{22}\text{O}_{11} \cdot \text{NaCl} \cdot 2\text{H}_2\text{O}$	6.79	3.08	1.419
$\text{C}_{12}\text{H}_{22}\text{O}_{11} + \text{NaCl}$	7.3	6.72	1.563

* M_C, M_B = Moles/100 g H_2O .B = SiO_2 ; C = K_2O , see Figs. 19 and 20

Locate the desired composition of solution in each figure, and interpolate the values of t and p . At these values the solution is saturated with respect to the phase within whose field the point falls, as indicated by the dotted boundary curves which appear as a background in Fig. 19.

Example: (Composition in Mol %).

50 % H_2O
25 % K_2SiO_3
25 % SiO_2
 $t = 360^\circ\text{C}$

 $p = \text{ca. } 45$ atm.Solid phase = $\text{K}_2\text{Si}_2\text{O}_5 \cdot \text{H}_2\text{O}$

For detailed data, v. (280); cf. (294).

B = CuCl ₂ ; C = KCl (274, 446)	
<i>t</i> , °C	<i>p</i> _{mm}
K ₂ CuCl ₄ ·2H ₂ O + CuCl ₂ ·2H ₂ O	
42.5	38.4
46.6	47.4
51.5	58.4
K ₂ CuCl ₄ ·2H ₂ O + CuCl ₂ ·2H ₂ O + KCuCl ₃	
56.1	73.4
KCuCl ₃ + CuCl ₂ ·2H ₂ O	
59.1	84.5
63.6	101.8
65.5	109
70.5	133
74.6	158
81.4	200.5
89.2	268
92.6	306
95	330
97.1	355
K ₂ CuCl ₄ ·2H ₂ O + KCuCl ₃	
65.5	116
74.6	172
86.4	260
88.2	276
89.2	292
92.0	322
K ₂ CuCl ₄ ·2H ₂ O + KCl	
42.5	46.2
46.6	57
51.5	70.4
56.1	88.4
59.1	100.4
63.6	119.4
65.5	131.5
74.6	187
81.4	233
86.4	272
K ₂ CuCl ₄ ·2H ₂ O + KCuCl ₃ + KCl	
92.4	330
KCuCl ₃ + KCl	
92.6	332
95	369.7
97.1	402.6
100	448

B = CaSO₄; C = NaCl (165)

<i>t</i> , °C	<i>p</i> _{mm}
NaCl + CaSO ₄	
0	4.2
5	5.0
10	6.9
15	9.5
20	13.0
25	17.5
30	23.4
35	31.0
40	40.8
45	53.0
50	68.3
55	87.3
60	111
65	139
70	173

B = CaSO ₄ ; C = NaCl.— (Continued)	
<i>t</i> , °C	<i>p</i> _{mm}
NaCl + CaSO ₄	
75	214
80	263
90	462
95	557
B = LiOH; C = Li ₂ CO ₃ (111, 133, 316, 434)	
g B/100 g A* <i>p</i> _{mm} , 100°C	
Li ₂ CO ₃	
0	760.00
1	747
2	730
3	713
4	696
5	679
6	662
10	542
15	604
LiOH + Li ₂ CO ₃	
16.5†	526

* Solutions saturated with C at all concentrations of B.

† Saturated with both B and C.

B = NaOH; C = NaCl
(7, 8, 265)First and second boiling points
and constitution diagrams

B = NaCl; C = KCl (233)	
<i>t</i> , °C	<i>p</i> _{mm}
NaCl + KCl	
20	12.64
22	14.25
24	16.03
26	18.01
28	20.20
30	22.60
32	25.25

B = NaCl; C = KClO ₃ (74)	
M* <i>p</i> _{mm} , 16.39°C	
NaCl + KClO ₃	
0	5.110

1.025	5.073
1.118	5.070
1.248	5.060
1.484	5.043
1.867	5.011
2.616	4.943
3.152	4.907
3.225	4.904
3.522	4.875
3.901	4.840
4.276	4.813
4.987	4.745
5.705	4.695
6.672	4.707

NaCl + NaClO ₃ + KClO ₃	
7.974	4.707

* M = Moles NaClO₃ per 1000 g
H₂O in the solution.

M'† | <i>p</i> _{mm} , 16.39°C	
NaCl + KClO ₃	
0	5.110
0.765	5.090
0.937	5.079

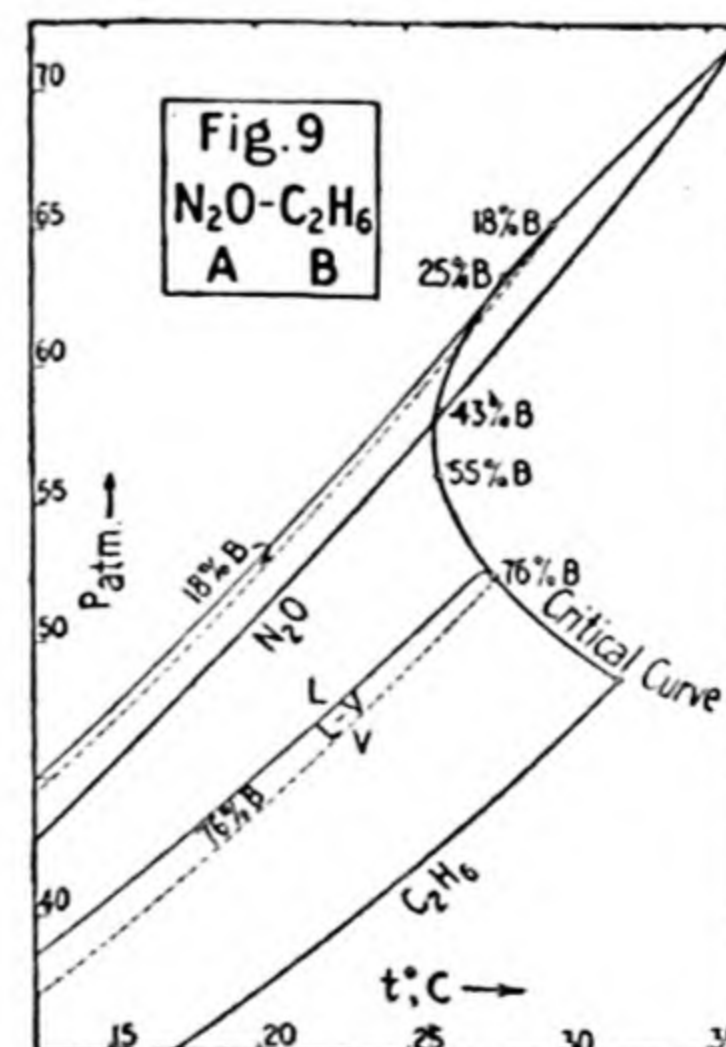
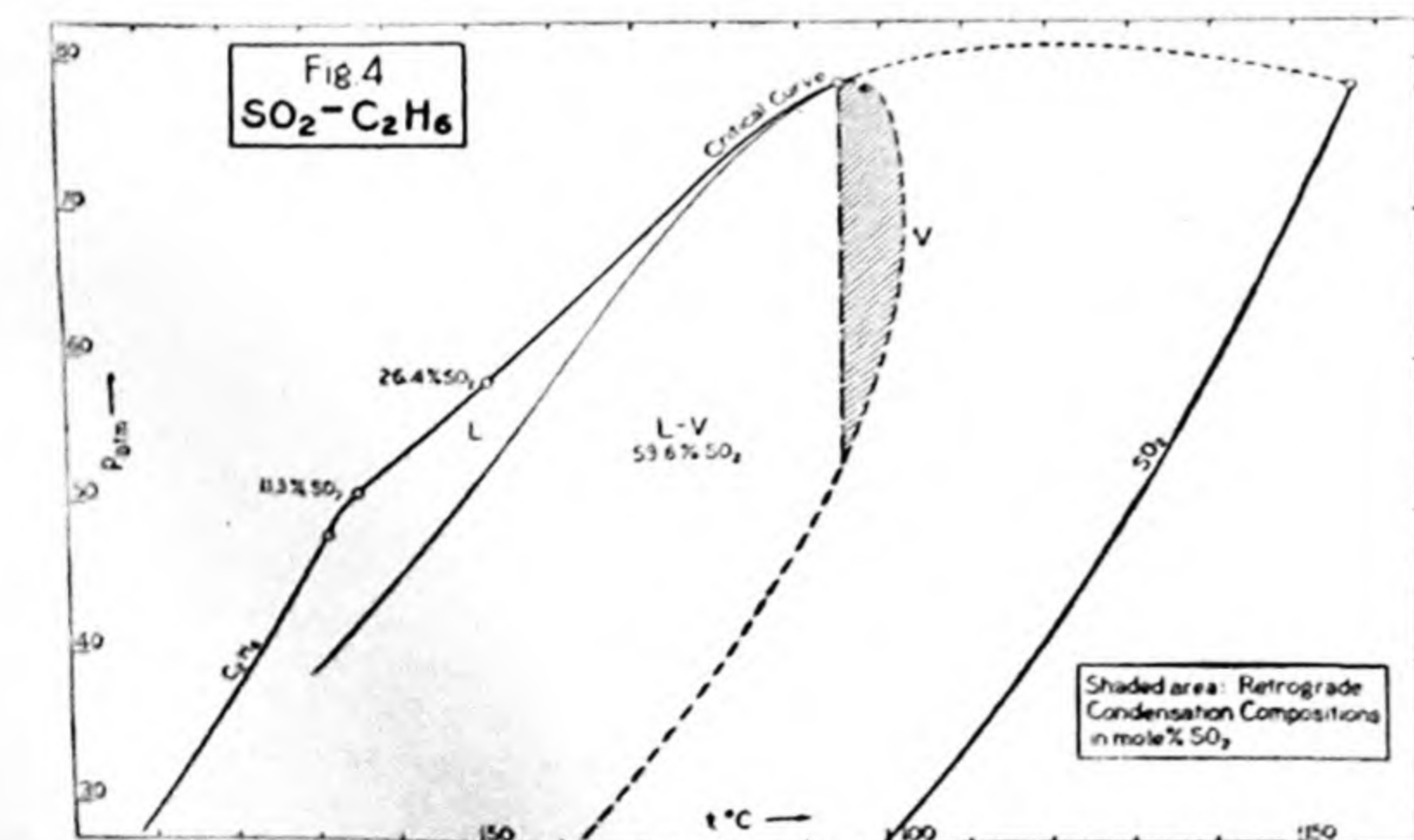
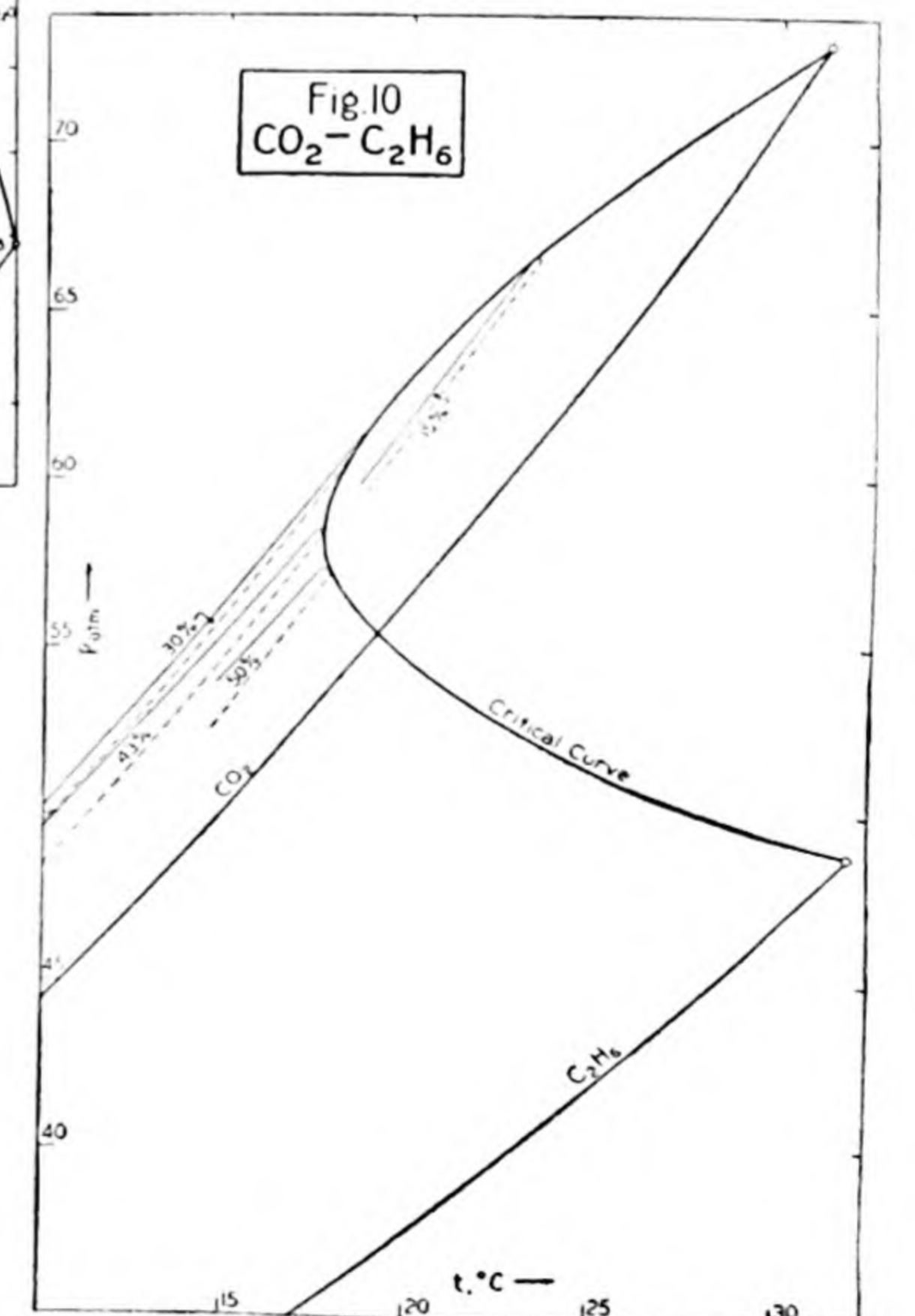
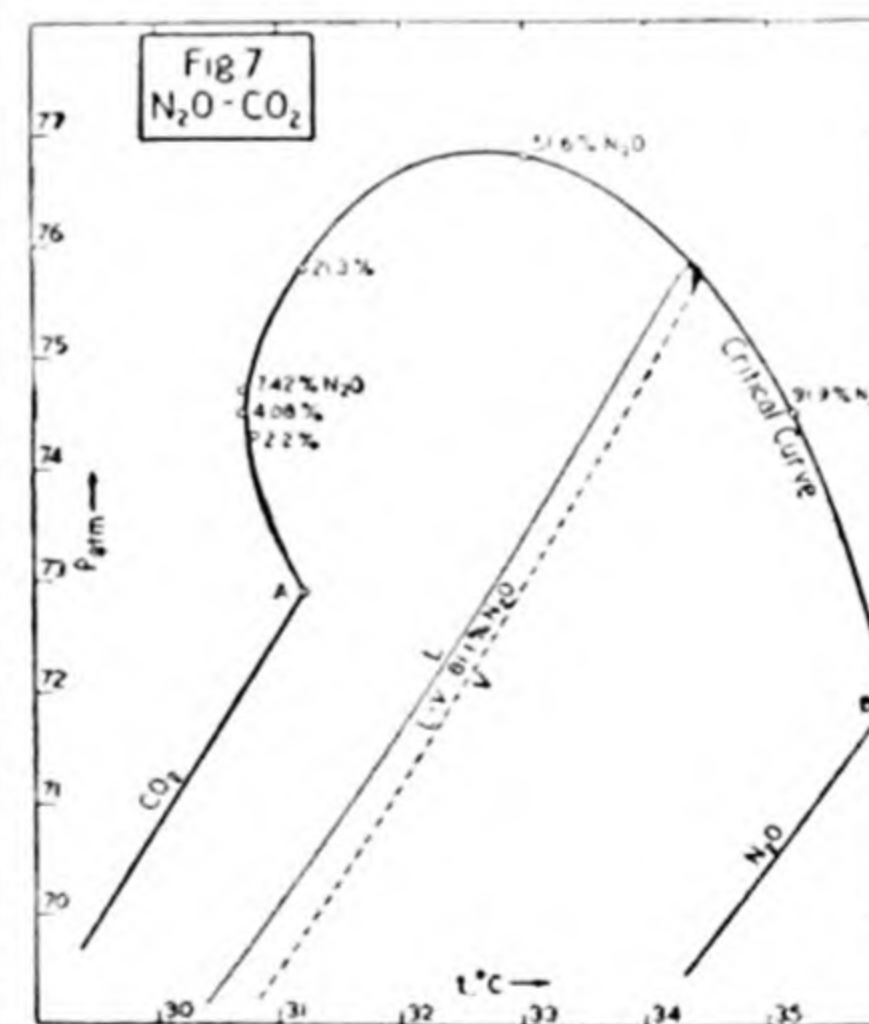
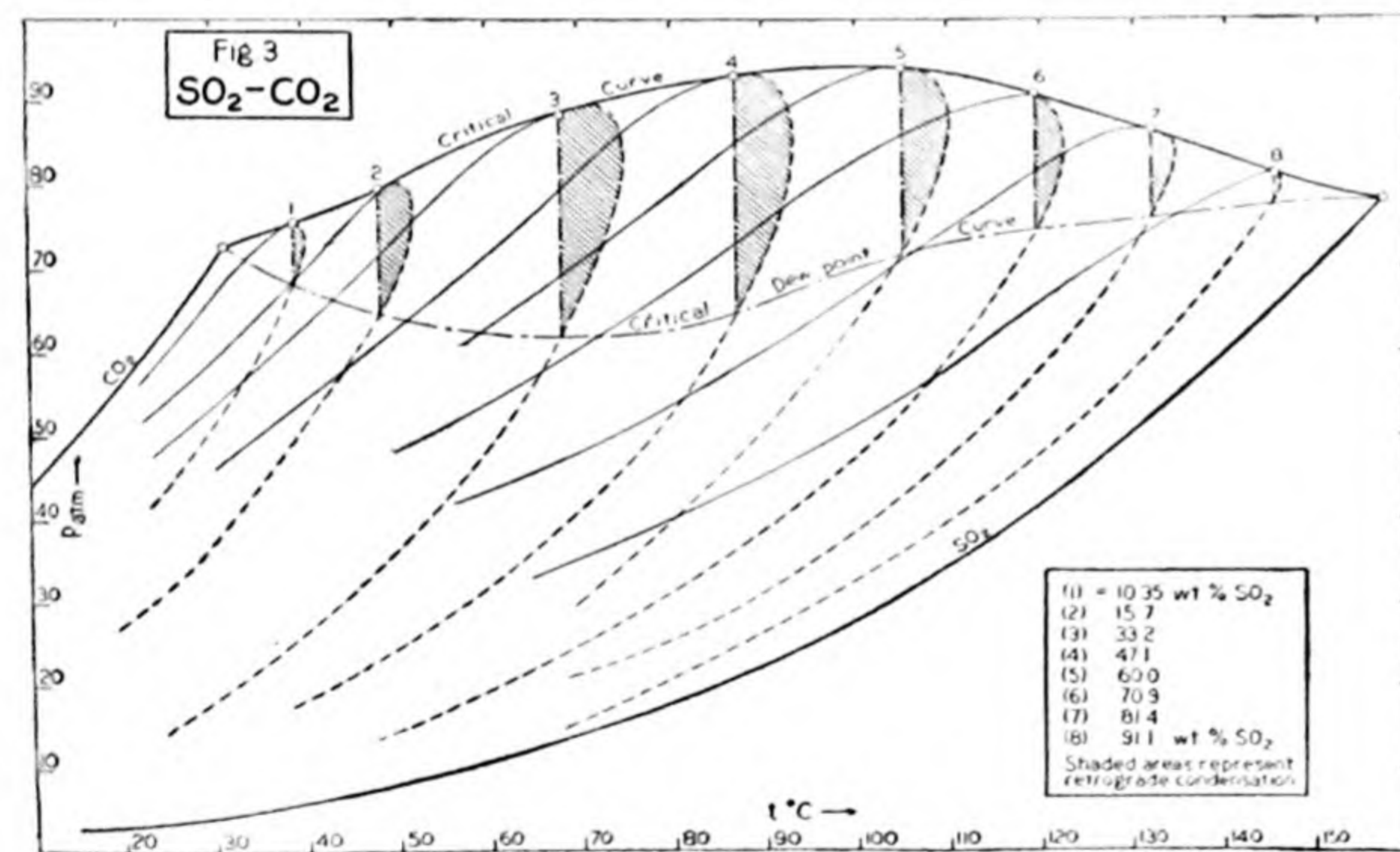
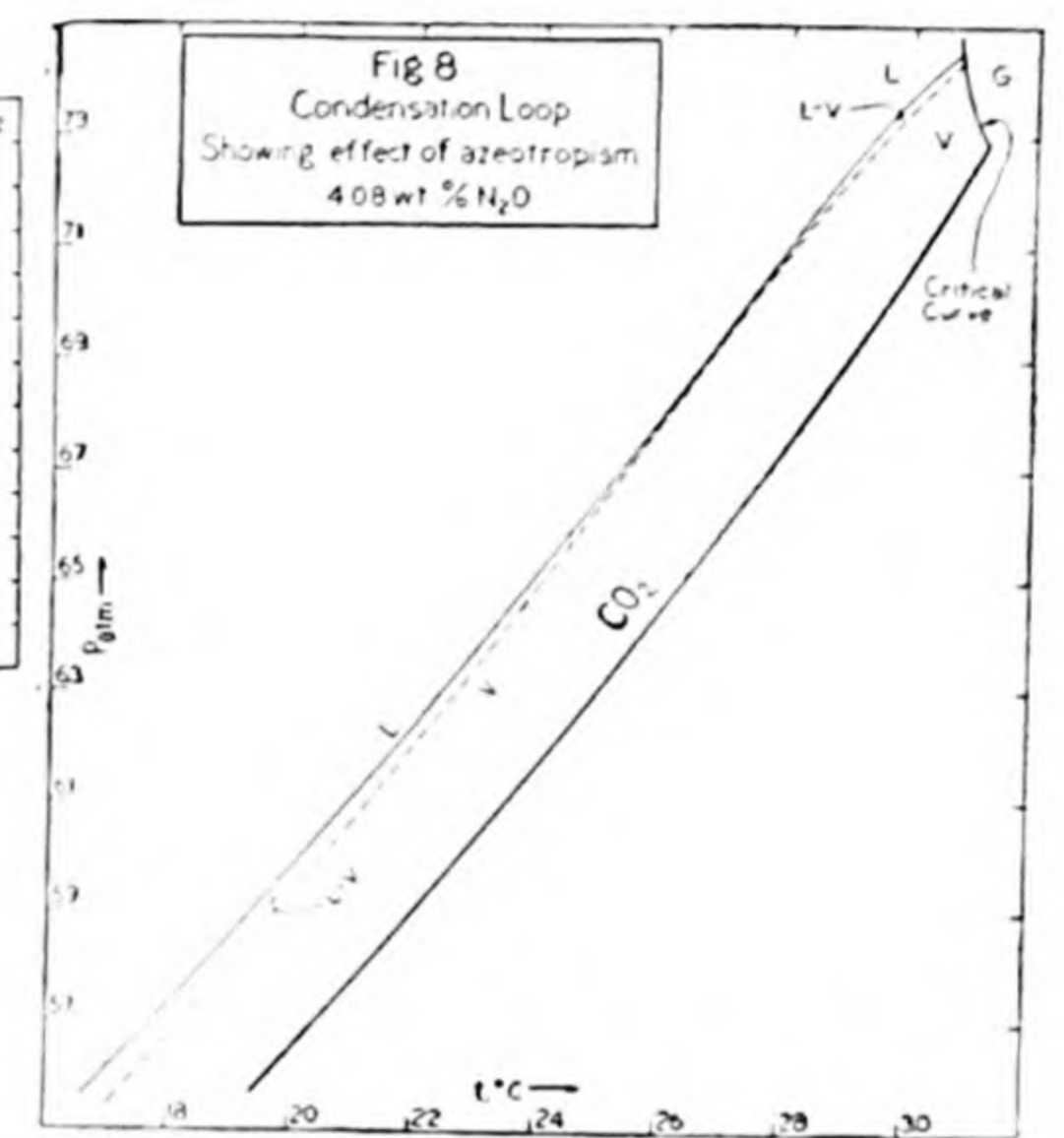
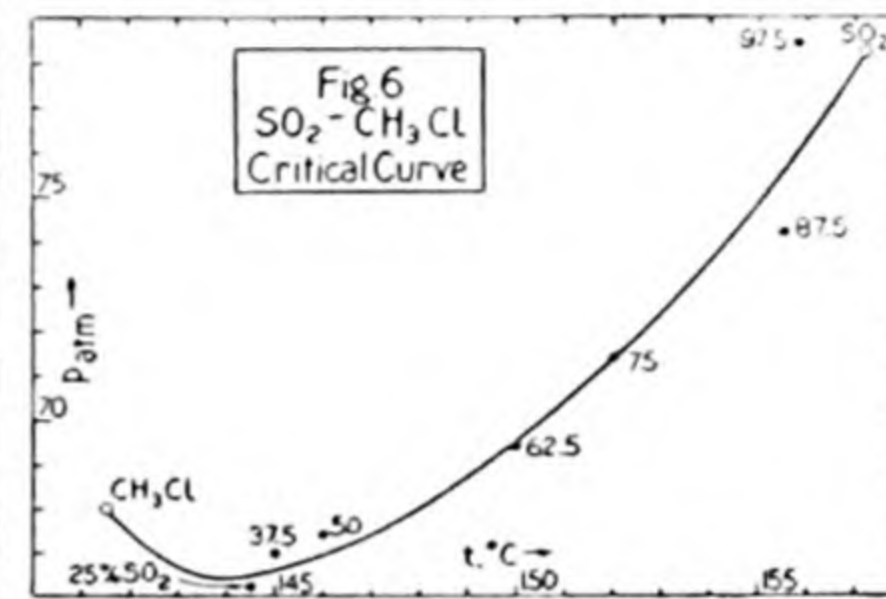
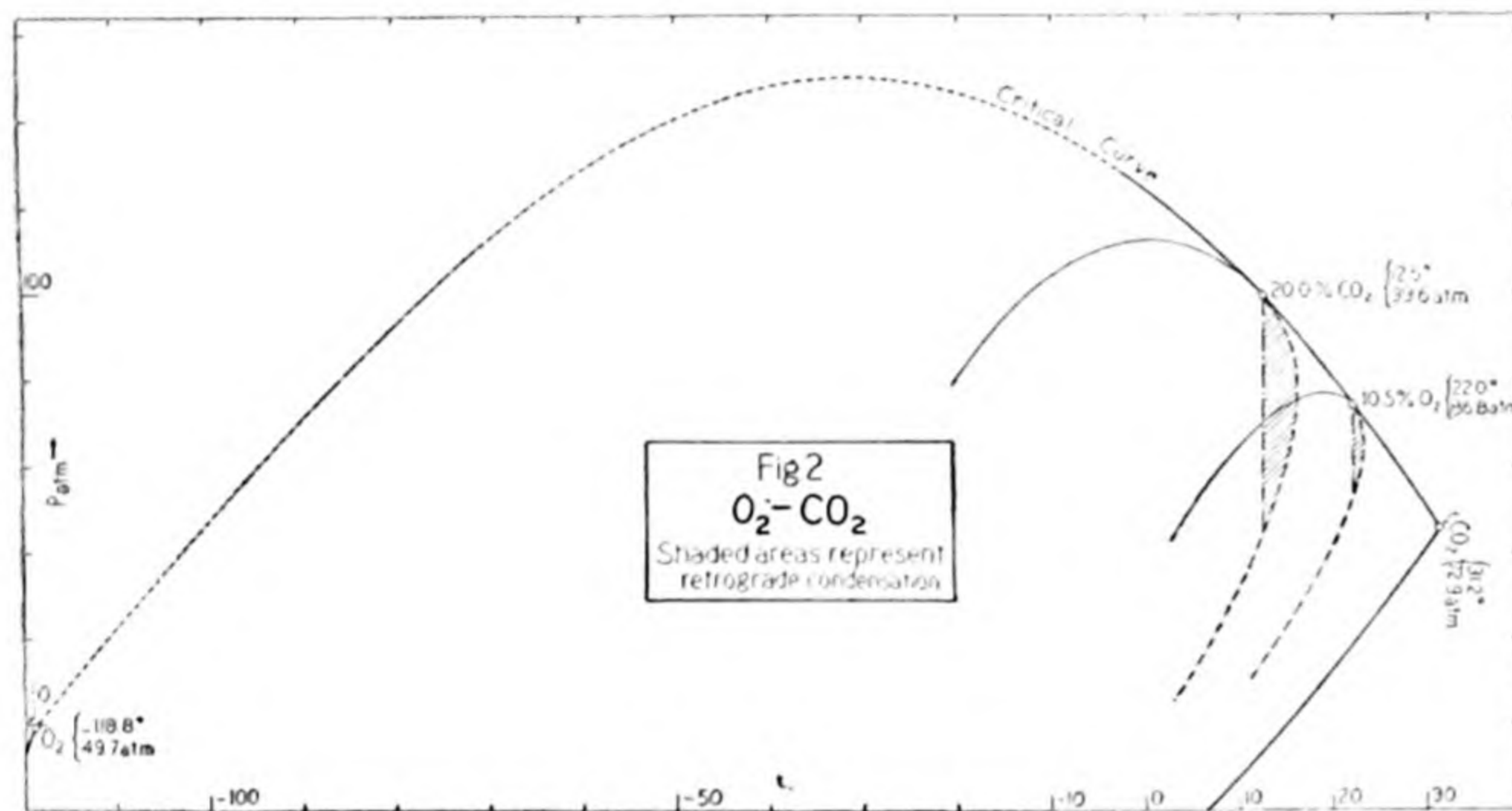
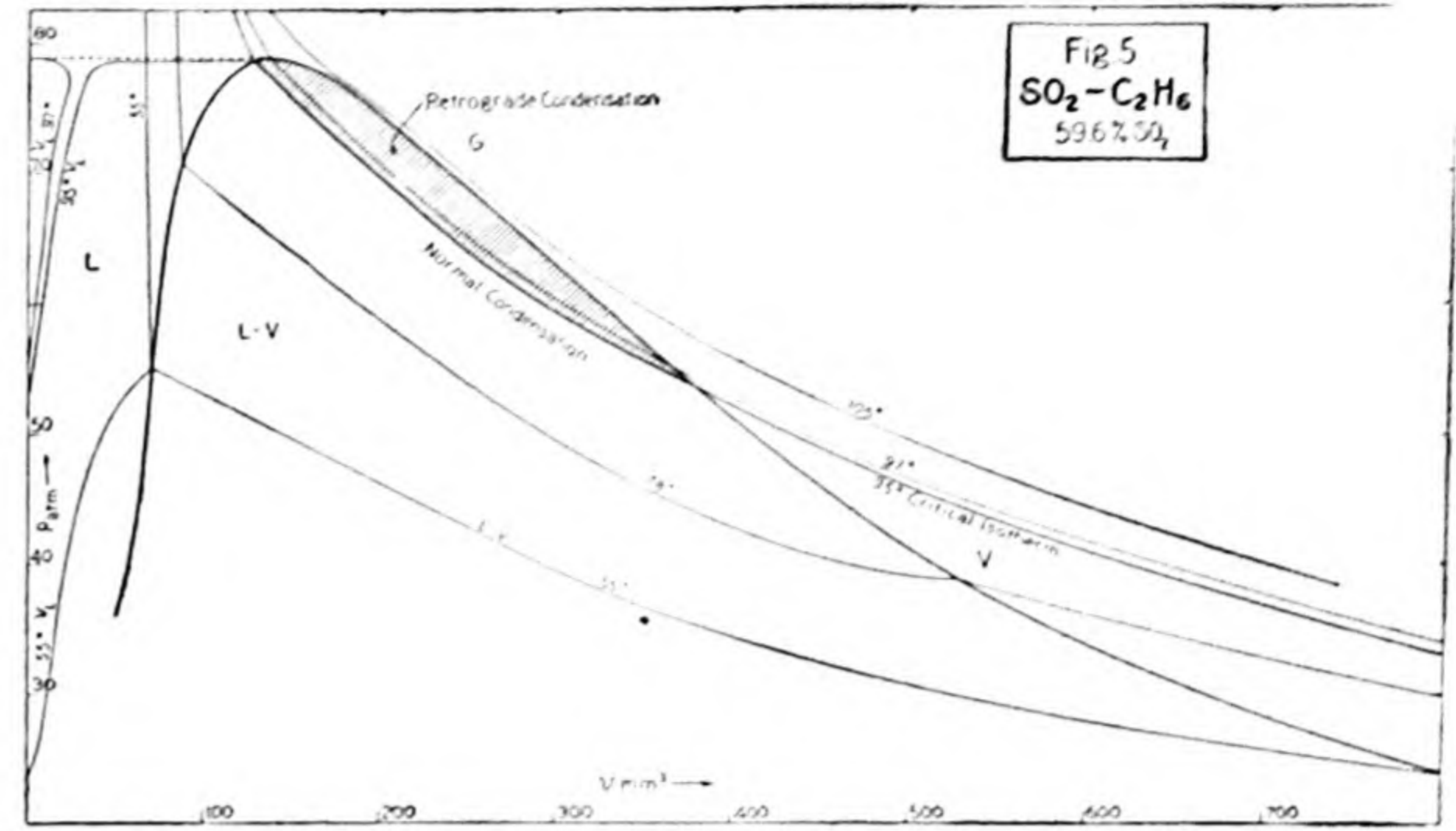
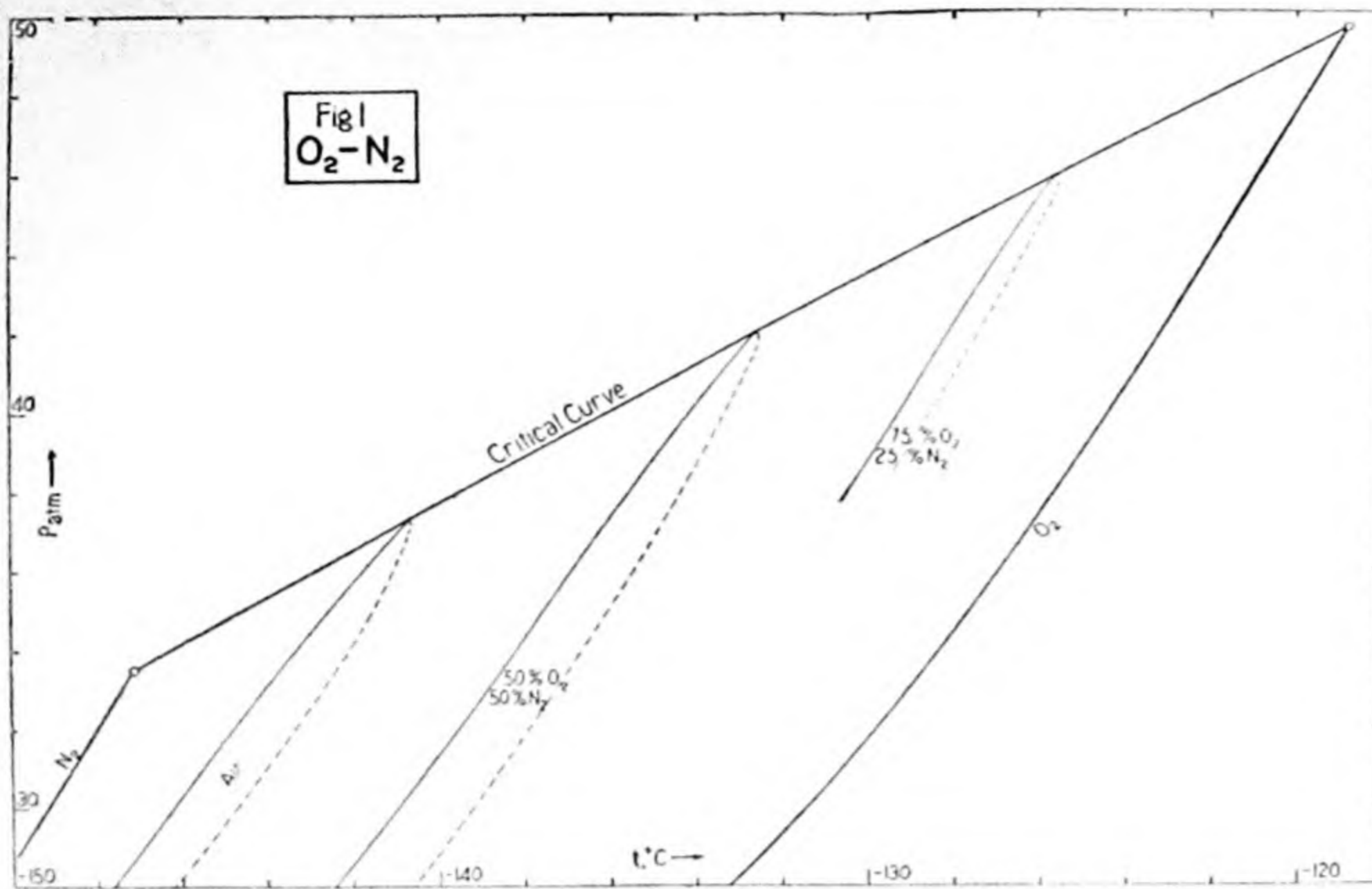
B = NaCl; C = KClO ₃ .— (Continued)	
M'† | <i>p</i> _{mm} , 16.39°C	
NaCl + KClO ₃	
1.075	5.067
1.237	5.051
1.388	5.034
1.540	5.014
NaCl + KCl + KClO ₃	
1.593	5.007
† M' = Moles KCl per 1000 g H ₂ O in the solution.	
B = NaCl; C = KNO ₃ (74)	
M* <i>p</i> _{mm} , 16.39°C	
NaCl + KNO ₃	
0	4.550
1.289	4.553

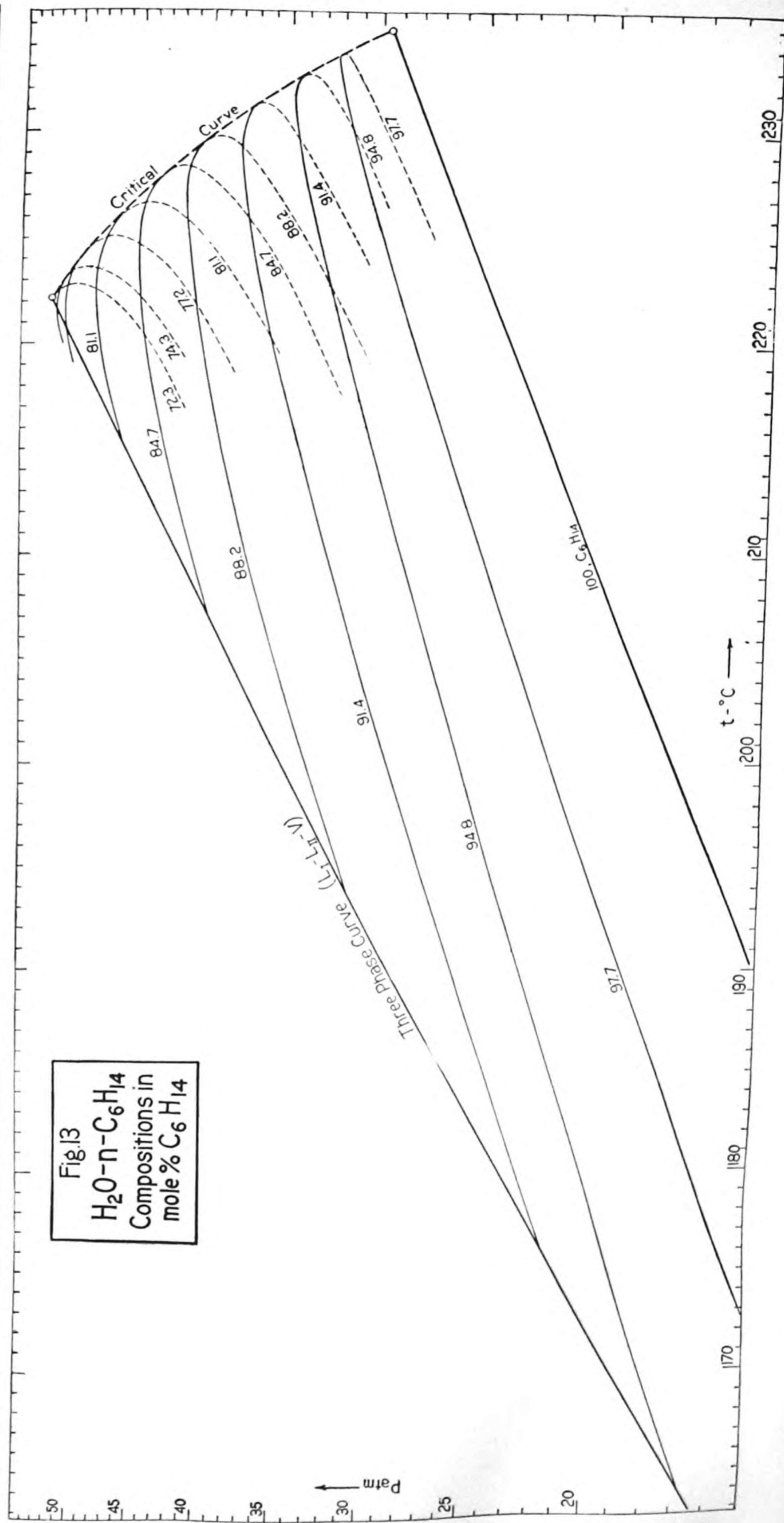
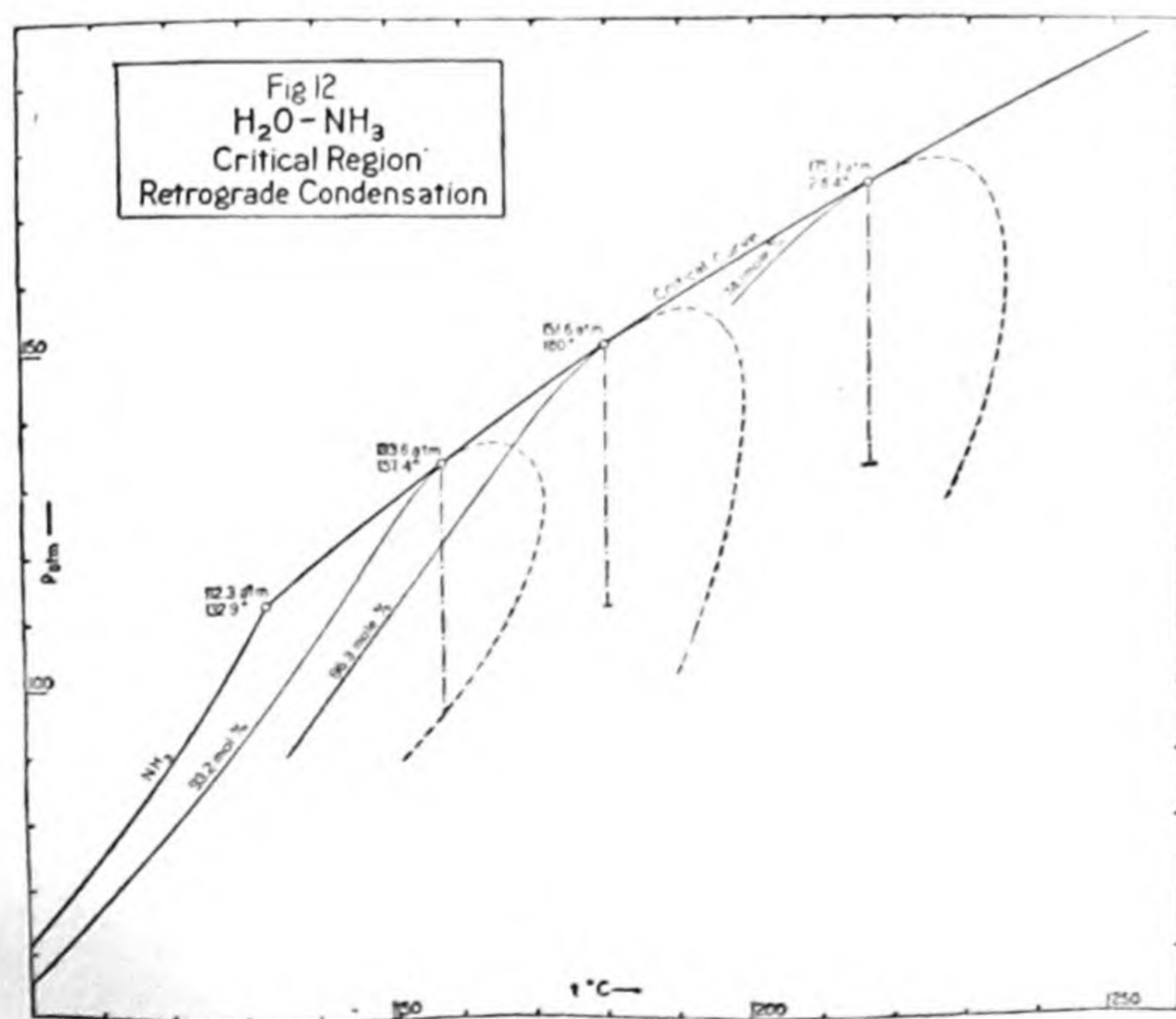
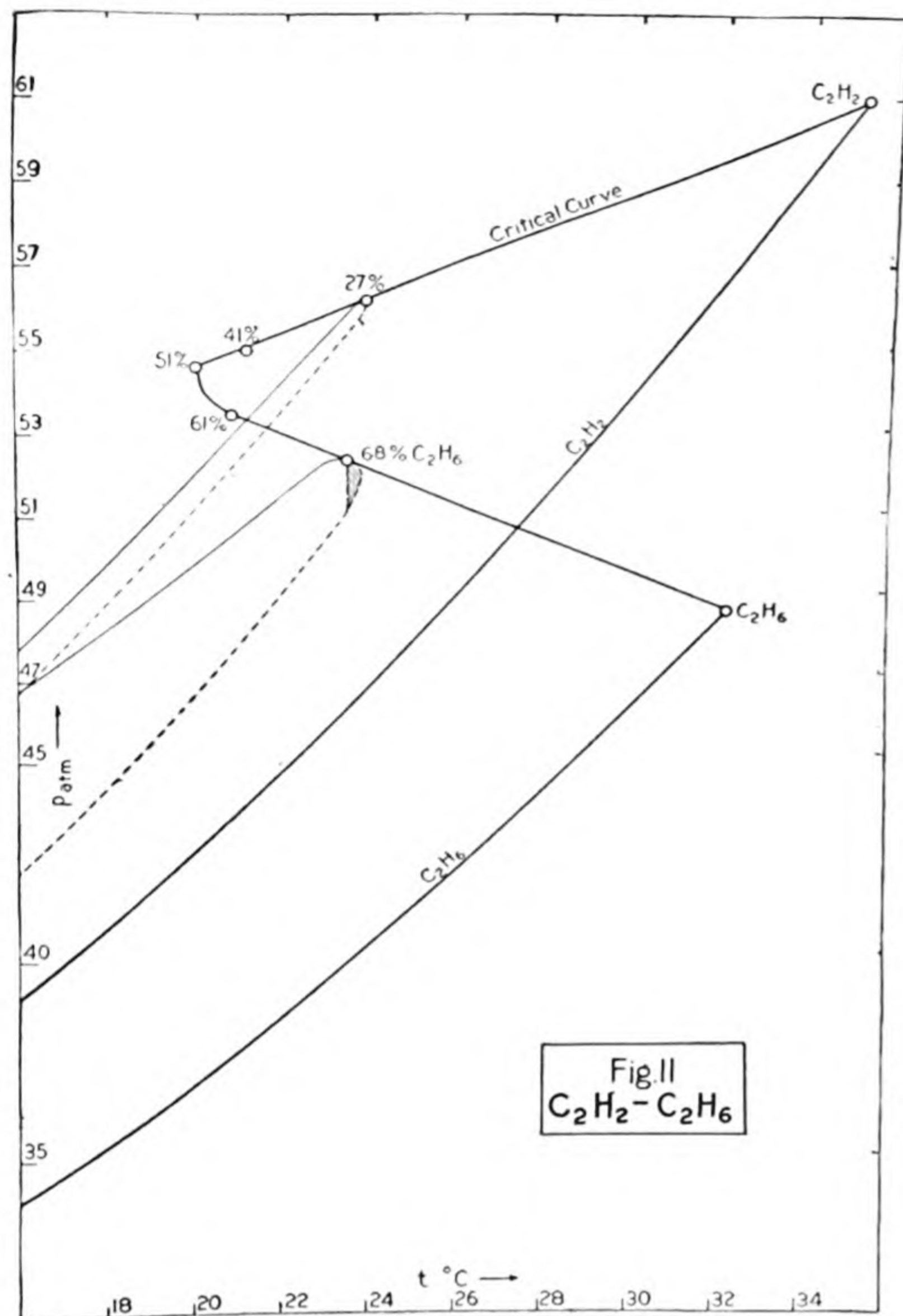
B = NaCl; C = KNO ₃ .— (Continued)	
M* <i>p</i> _{mm} , 16.39°C	
NaCl + KNO ₃	
2.488	4.487
3.745	4.431
4.197	4.400
4.657	4.369
5.031	4.345
5.936	4.289
NaCl + KNO ₃ + NaNO ₃	
6.51	4.263
NaCl + KNO ₃	
6.854†	4.253
* M = Moles NaNO ₃ per 1000 g H ₂ O in the solution.	
† Supersaturated with NaNO ₃ .	

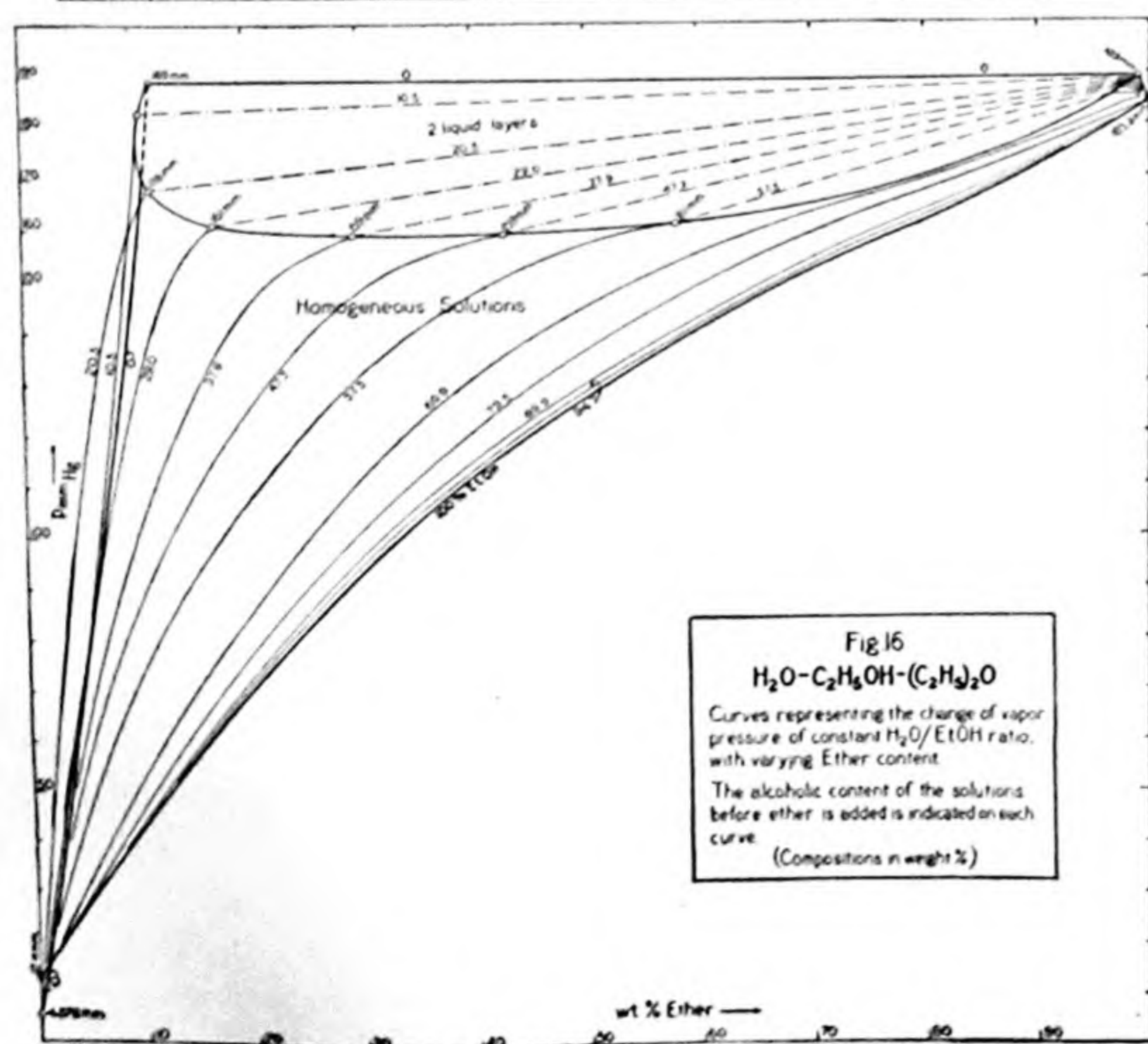
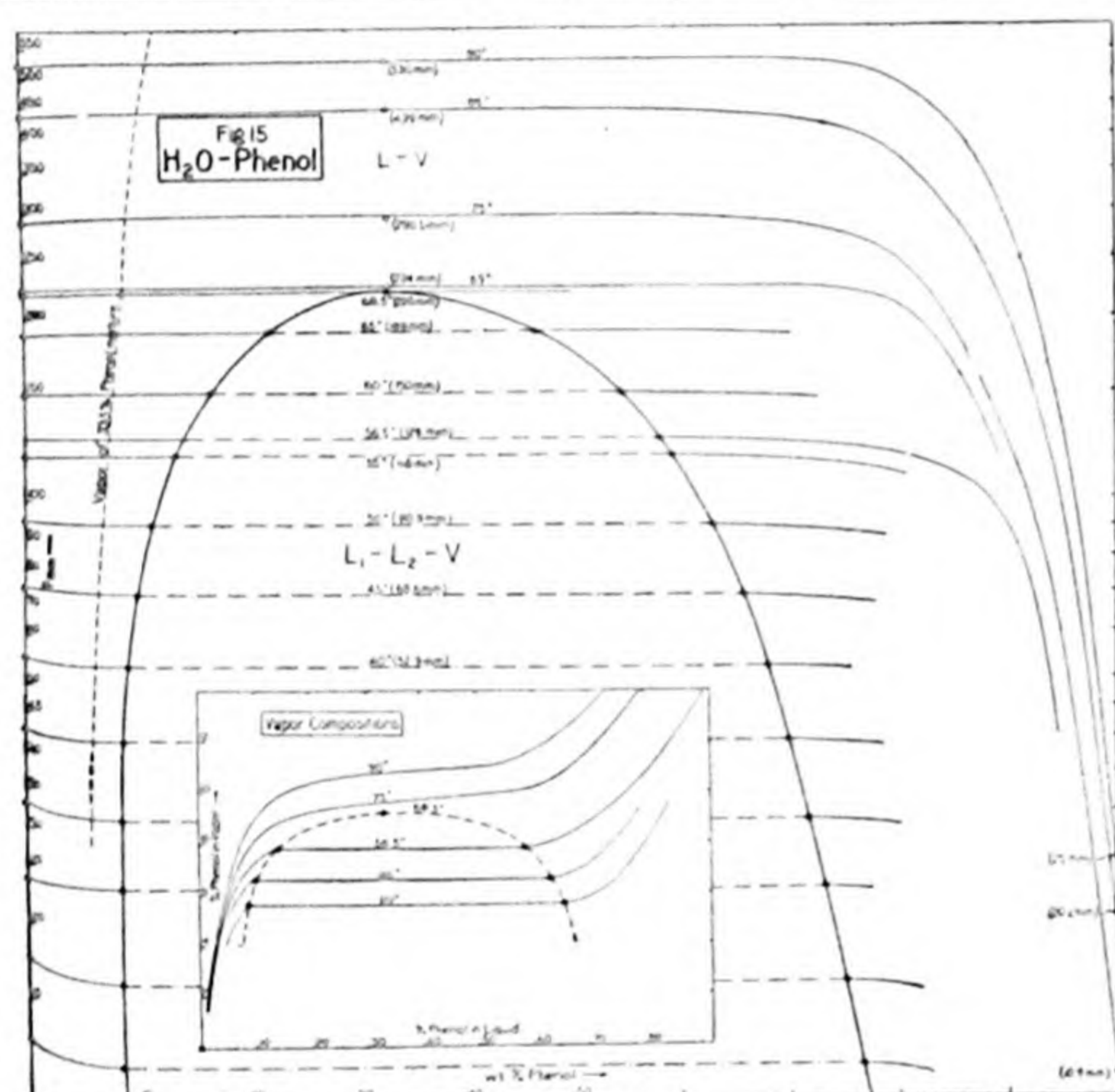
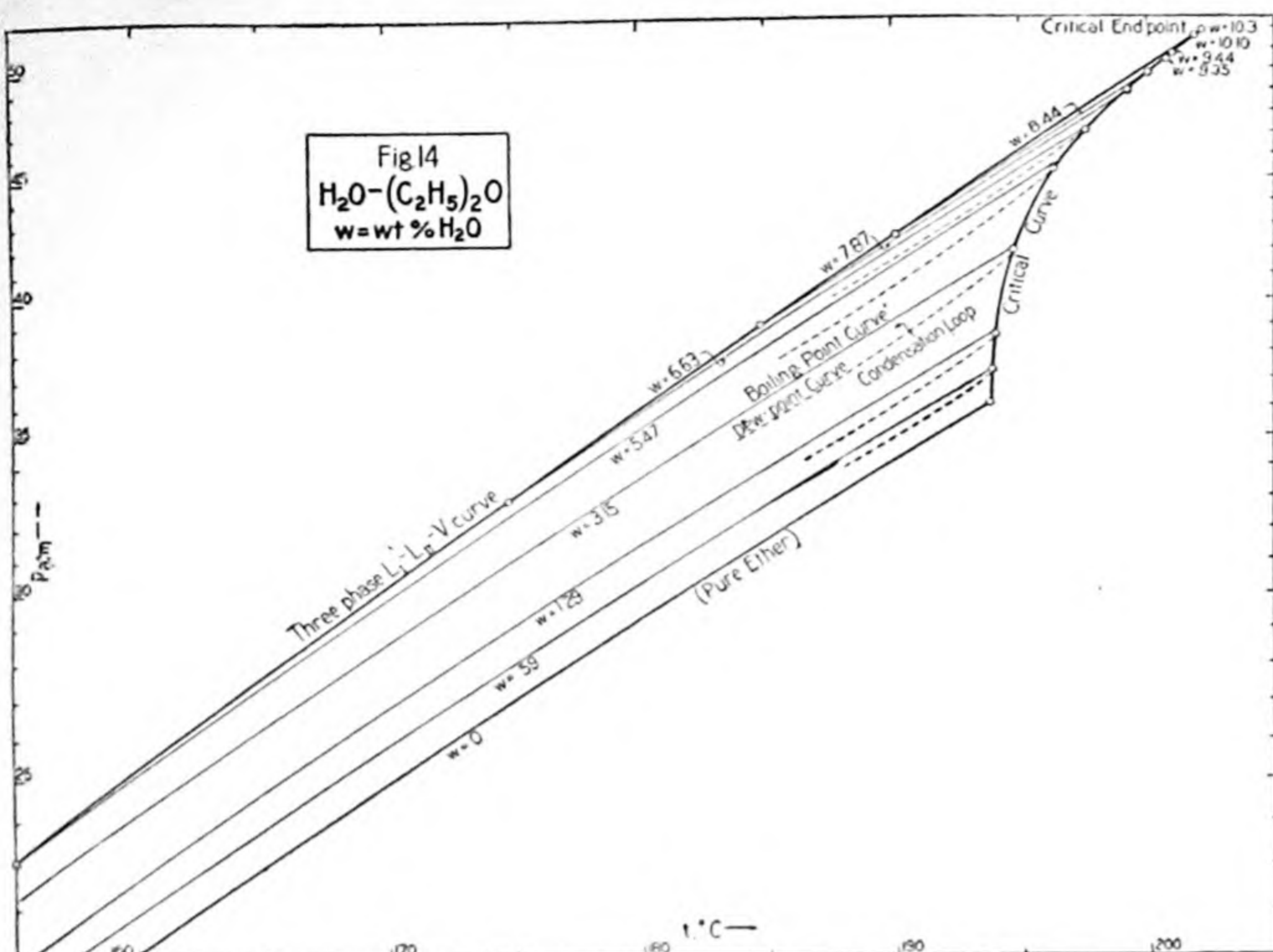
LITERATURE

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RELATIVE EFFICIENCIES OF DRYING AGENTS

MARTIN SHEPHERD

VALUES OF MG RESIDUAL H₂O PER LITER OF GAS DRIED AT 25°C

Drying agent	mg H ₂ O	Lit.
A filter at -194°	1.6×10^{-23}	
P ₂ O ₅	$<2 \times 10^{-6}$	(6)
Mg(ClO ₄) ₂	$<5 \times 10^{-4}$	(7)
Mg(ClO ₄) ₂ ·3H ₂ O	$<2 \times 10^{-3}$	(7)
KOH (fused)	0.002	(1, 3)
Al ₂ O ₃	0.003	(3, 4)
H ₂ SO ₄	0.003	(1, 2)
MgO	0.008	(3)
NaOH (fused)	0.16	(1)
CaBr ₂	0.2	(1)
CaO	0.2	(3)
CaCl ₂ (gran.)	0.14 to 0.25	(5)

Drying agent	mg H ₂ O	Lit.
H ₂ SO ₄ , 95.1%	0.3	(3)
CaCl ₂ (fused)	0.36	(1, 2)
ZnCl ₂	0.8	(1, 2)
ZnBr ₂	1.1	(1)
CuSO ₄	1.4	(3)

LITERATURE

(For a key to the periodicals see end of volume)

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PHASE-EQUILIBRIUM DATA

SYSTEMS COMPOSED OF LIQUID PHASES ONLY*	SYSTÈMES COMPOSÉS UNIQUEMENT DE PHASES LIQUIDES	SYSTEME DIE NUR FLÜSSIGE PHASEN ENTHALTEN	SISTEMI COSTITUITI SOLTANTO DI FASI LIQUIDE	PAGE
Two-component systems.	Systèmes à deux constituants.	Zweikomponenten Systeme.	Sistemi a due componenti.	
Solubilities of liquids in liquids.	Solubilités des liquides dans les liquides.	Löslichkeiten von Flüssigkeiten in Flüssigkeiten.	Solubilità dei liquidi nei liquidi.....	386
Systems containing more than two components.	Systèmes ayant plus de deux constituants.	Systeme mit mehr als zwei Komponenten.	Sistemi con più di due componenti.	
Miscibility relations.	Rapports de miscibilité.	Mischungsverhältnisse.	Rapporti di miscibilità..	398
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* Including also systems of two liquid phases in the presence of the vapor phase but in most cases without determination of the pressure or composition of the vapor.

SOLUBILITIES OF LIQUIDS IN LIQUIDS. TWO-COMPONENT SYSTEMS*

ARTHUR E. HILL

CONTENTS	MATIÈRES	INHALTSVERZEICHNIS	INDICE	PAGE
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Sec. 2. The key-formula of neither component begins with 16.	Sec. 2. La formule-clé d'aucun des constituants ne commence par 16.	Sec. 2. Die Schlüsselformel keiner der beiden Komponenten beginnt mit 16.	Sez. 2. Nessuno dei componenti ha una formula chiave che comincia con 16.....	393
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ABBREVIATIONS AND CONVENTIONS

Compositions are in Wt. % unless otherwise noted.

In nearly all cases the experiments were performed in sealed tubes, consequently, for values at room temperature, the pressure equalled one atmosphere; was greater than one atm. at higher temperatures and less than one atm. at lower temperatures.

Q_x quadruple point with the substance X present as crystalline phase.

m metastable.

* Including some systems in which one phase is a natural or commercial oil.

ABRÉVIATIONS ET CONVENTIONS

Les compositions sont exprimées en % poids à moins d'une autre indication.

Dans presque tous les cas, les expériences ont été effectuées dans des tubes scellés, par conséquent pour les valeurs à la température de la chambre, la pression égale une atmosphère; cette pression sera supérieure à une atm. pour des températures plus élevées et moindre qu'une atm. pour des températures plus basses.

Q_x point quadruple avec la substance X présente comme phase cristalline.

m métastable.

* Sont inclus quelques systèmes dans lesquels une phase est une huile naturelle ou de commerce.

ABKÜRZUNGEN UND FESTLEGUNGEN

Die Zusammensetzungen sind, wenn nichts anderes bemerkt, in Gewichts-Prozenten (Wt. %) angegeben.

In beinahe allen Fällen wurden die Experimente in zugeschmolzenen Röhren ausgeführt. Es gilt deshalb der Wert für Zimmertemperatur und dem Druck von einer Atmosphäre. Er war grösser als eine Atmosphäre bei höherer, kleiner bei tieferer Temperatur.

Q_x Quadrupel-Punkt mit der Substanz X als kristalline Phase.

m metastabil.

* Enthält einige Systeme in welchen eine Phase ein vegetabilisches oder ein sonst in Verwendung befindliches Öl ist.

ABBREVIAZIONI E CONVENZIONI

Le composizioni, salvo i casi in cui è indicato diversamente, sono indicate in percentuale in peso.

In quasi tutti i casi le esperienze sono state eseguite in tubi chiusi, e perciò a temperatura ordinaria la pressione era quella di una atmosfera, mentre, a temperature superiori, era maggiore di una atmosfera, e, a temperature inferiori, minore.

Q_x punto quadruplo in presenza della sostanza X allo stato di fase cristallina.

m metastabile.

* Sono compresi alcuni sistemi nei quali una delle fasi è un olio naturale o commerciale.

H₂O.—(Continued)**C₄H₈O₂,* *n*-Butyric acid**
(34, 143)

°C	% B	
-7		60.6
-6		58.1
-5	24.6	55.3
-4	27.8	51.4
-3.5	30.8	48.6
-3	39.5	

* The two-liquid system is metastable throughout.

C₄H₈O₂, Isobutyric acid
(27, 34, 42, 110, 135, 150)

-5	15.3	
0	15.8	80
+5	16.5	74.5
10	17.7	68.9
15	19.4	63.9
20	22.5	58.3
21	23.3	56.6
22	24.6	54.3
23	26.4	51.5
24	29.4	46.6
24.5	38	

C₄H₈O₂, Ethyl acetate (31, 32, 53, 83, 90, 103, 121)

0	10.08	97.72
5	9.49	97.56
10	8.88	97.39
15	8.40	97.18
20	7.94	96.99
25	7.56	96.76
30	7.22	96.53
35	7.01	96.27
40	6.86	96.00
45	6.76	95.75
50	6.70	95.47
55	6.66	95.19
60		94.90

C₄H₈O₂, Methyl propionate
(103, 148)

0	7.80	
10	6.80	
20	6.10	
30	5.60	

C₄H₈O₂, Propyl formate
(103, 148)

0	3.39	
10	3.00	
20	2.79	
30	2.70	

C₄H₁₀O, *n*-Butyl alcohol (56)

-2.95Q _A		
+5	80.38	9.55
10	80.33	8.91
15	80.14	8.21
20	79.93	7.81
25	79.73	7.35
30	79.38	7.08
35	78.94	6.83
40	78.59	6.60
50	77.58	6.46
60	76.38	6.52
70	74.79	6.73

C₄H₁₀O.—(Continued)

°C	% B	
80	73.53	6.89
90	69.9	7.9
100	66.2	9.2
110	62.4	10.5
115	59.0	12.8
120	54.0	16.1
125.15	32.5	

C₄H₁₀O, Isobutyl alcohol

(3, 154)

30	7.75	82.9
40	7.25	81.8
50	7.1	80.6
60	7.1	79.2
70	7.2	77.6
80	7.55	75.6
90	8.2	73.5
100	9.35	70.2
105	10.3	68.9
110	11.3	67.0
115	12.3	64.75
120	14.85	61.7
125	18.0	57.47
130	23.6	51.25

(132) 36.8

C₄H₁₀O, sec.-Butyl alcohol
(3, 24, 143, 145)

-10	25.2	
0	25.0	61.8
+10	23.4	61.7
20	20.1	63.7
30	17.2	65.0
40	15.0	65.5
50	14.0	65.7
60	13.3	65.7
70	13.2	65.4
80	13.7	64.5
90	14.9	63.3
100	17.4	59.3
110	22.3	52.4
113.1	(35.7)	

C₄H₁₀O, Ethyl ether (1, 8, 25, 41, 50, 52, 57, 64, 67, 79, 80, 94, 96, 97, 98, 103, 113, 118, 141, 142, 147, 156)

°C	% A	% B
-20	0.747	(156)
-3.8	Q _A	†
to		
+35		
40	1.50	4.50
50	1.66	4.04
60	1.72	3.60
70	2.00	3.10
80	2.17	2.75
90	2.33	

* % A = 0.9828 + 0.01302t (52).
† % B = 11.60 - 0.2998t + 0.003016t² (52).**C₄H₁₀S, Ethyl sulfide (103)**

°C	% B
0	0.394
10	0.347
20	0.310
30	0.296

C₄H₁₁N, Diethylamine (3, 47, 74)

°C	% B	
143.5	37.5	
144	30	45
145	27.6	49
150	23.6	55.4
155	21.7	58.5

C₅H₄O₂, Furfural (82, 110)*p*: varying

10	7.9	96.1
20	8.3	95.2
30	8.8	94.3
40	9.1	93.4
50	9.8	92.6
60	10.8	91.6
70	12.4	90.4
80	14.2	88.8
90	16.2	86.5
100	19.2	83.5
110	24	78.5
115	28	74.6
120	34.4	68.1
122.7	51	

C₅H₈O₂, Acetylacetone (110)

30	15.4	95.1
40	17.4	93.8
50	20.0	92.0
60	23.1	89.4
70	27.0	85.8
75	30.0	83.1
80	34.0	78.8
87.7	56.5	

C₅H₁₀N₂O, Nitrosopiperidine
(36)

40		93.6
60		91.3
80	8.4	88.8
100	9.1	86.2
120	10.7	81.8
140	20.4	70.7
145	26	64.8
150.3	45	

C₅H₁₀O, Diethyl ketone
(110, 148)

20	4.6	
40	3.4	97.4
60	3.0	96.2
80	3.2	94.9
100	3.7	93.1
120	4.0	90.2
140	4.7	87.0
160	6.1	83.3

C₅H₁₀O₂, Valeric acid (78)

16	3.5	90.4
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C₅H₁₀O₂, Ethyl propionate
(103, 148)

0	3.41	
10	2.78	
20	2.32	
30	2.02	

C₅H₁₀O₂, Methyl butyrate
(148)

22	1.7	
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C₅H₁₀O₂, Isobutyl formate
(148)

°C	% B	
22	1.0	

C₅H₁₀O₂, Propyl acetate
(103, 148)

0	3.35	
10	2.57	
20	2.30	
30	2.05	

C₅H₁₂O, Isoamyl alcohol*
(3, 6, 40, 50, 64, 153, 158, 160)

0	3.6	91.6
10	3.15	91.0
20	2.75	90.4
30	2.45	90.0
40	2.2	89.4
50	2.2	88.8
60	2.2	88.1
70	2.3	87.4
80	2.4	86.3
90	2.7	85.2
100	2.8	83.8
120	3.4	80.8
140	4.9	76.4
160	7.4	69.8
170	9.9	64.8
180	12.0	57.5
185	19.0	50.0
187.5	36.6	

* The isoamyl alcohol contained varying amounts of active amyl alcohol; the amount present in the most heavily weighted curve was 16 %.

C₆H₄N₂O₅, 2, 3-Dinitrophenol
(125)

94.5m	6.74	
95Q _B		
108.2	10.90	
116.7		60.44
120.1	20.83	
120.4		52.15
122.2	35.13	
122.5	(36)	

C₆H₄N₂O₅, 2, 4-Dinitrophenol
(125)

100.5m		99.02
104.2Q _B		
109.6	1.95	
117.6		98.24
121.7		97.70
126.1	2.98	
131.2		97.14
137.7	3.81	
156.0		93.35
170.5	8.99	
182.5*	12.98	

* Consolute point above 200°.

C₆H₄N₂O₅, 2, 5-Dinitrophenol
(125)

92.4m		97.50
97.5Q _B		
113.5		96.72
124.7	2.33	
135.8	2.97	

C₆H₄N₂O₆—(Continued)

°C	% B	
146.4	3.91	94.51
162.1	5.69	
172.2		91.73
194.5*	12.24	

* Consolute point above 200°.

C₆H₄N₂O₆, 2, 6-Dinitrophenol (125)

59.2Q _B		
71.1	0.703	
84.5		98.42
89.5	1.00	
102.6		97.80
117.6	1.87	
138.3		95.96
139.7	3.24	
147.9	3.97	
158		93.44
192.5*	12.26	

* Consolute point above 200°.

C₆H₄N₂O₆, 3, 4-Dinitrophenol (125)

48m		74.91
52.5Q _B		
73.8		70.23
82	6.05	
97.5	12.79	
101.6		55.40
104.6	23.28	
105.2	36.5	

C₆H₅ClO, *o*-Chlorophenol (134)

- 0.3Q _A		86.5
+82.9	3.76	
91.5		85.9
106.3	5.12	
118.9		82.82
156.6		70.62
159.1	13.58	
165.8	16.95	
166.2		60.72
170.1		54.95
170.7	22.59	
172.9		45.04
173	33	

C₆H₅ClO, *m*-Chlorophenol (134)

-0.4mQ _A		83.4
+3.2Q _B		(83.3)
11.8		82.9
23.1		82.3
85.25	5.12	
109.8		71.23
123.0	13.56	
127.5	17.84	
129.1		55.65
130.5		46.12
130.7		38.89
130.8	32.02	

C₆H₅ClO, *p*-Chlorophenol (134)

-0.3Q _B		86.5
+5.5		86.19

C₆H₅ClO—(Continued)

°C	% B	
17.0		85.42
35.5		84.02
65.0	3.91	
97.0		74.03
107.7		69.36
113.8	10.66	
115.5		65.05
122.4		59.62
125	20.50	
125.8		53.49
128.2	29.16	
128.7		42.57
129	(38)	

C₆H₅NO₂, Nitrobenzene (14, 22)

10		99.82
20	0.19†	99.78
30	0.22†	99.73
55	0.27†	99.47
100	0.80	98.60
120*	1.6	
130*	2.1	
140*	2.7	
160*	4.0	93.0
180*	5.2	92.0
200*	8.2	88.0
220*	15.8	82.0
230*	24.0	74.0
235*	49	

* Data from (14).

† Data from (22).

C₆H₅NO₃, *o*-Nitrophenol (133)

43.5Q _B	0.35	99.48
60	0.46	99.24
80	0.69	98.80
100	1.08	98.22
120	1.59	97.40
140	2.32	96.40
160	3.75	95.00
180	6.80	93.12
200*	(10.5)	(89.5)

* Consolute temp. above 200°.

C₆H₅NO₃, *m*-Nitrophenol (133)

41.5Q _B	3.16	74.0
50	3.7	72.7
60	4.5	70.7
70	5.75	68.3
80	7.85	64.6
90	11.7	58.8
95	15.6	53.0
98.7	(33)	

C₆H₅NO₃, *p*-Nitrophenol (133, 143)

39.6Q _B	3.26	71.2
50	4.37	68.5
60	5.46	65.8
70	7.8	63.0
80	11.2	59.4
85	15.5	55.7
90	25.7	45.9
91.6	35.8	

C₆H₆, Benzene (18, 45, 48, 50, 52, 59, 60, 93)

°C	% A	
5.4Q _B	0.0335	
10	0.041	
20	0.057	
30	0.082	
40	0.114	
50	0.155	
60	0.205	
70	0.270	
°C	% B	
0	0.08	
25	0.15	
100*	0.176	
150*	0.525	
200*	1.81	
250*	6.04	
285*	8.53	
300*	11.4	

* Data from (59, 60).

C₆H₆N₂O₂, *o*-Nitroaniline (132)

63Q _B		97.5
68		97.23
91		96.16
128.4	2.95	
142		92.06
160		89.5
164.5	7.19	
178.5	10.74	
188.5		81.88
194.2	17.50	
206.2		66.89
208.6	36.71	
210.3		52.30
211	48.4	

C₆H₆N₂O₂, *m*-Nitroaniline (132)

99Q _B		93.5
125		90.02
136.5	6.04	
159.9		83.60
164.2	13.08	
169.3		79.82
176.7		75.77
180.5	25.39	
185.2	36.94	
185.8		57.55
186.1	50.57	
187.5	(48.5)	

C₆H₆N₂O₂, *p*-Nitroaniline (132)

115.5Q _B		90.0
123.5	5.16	
124.2		92.52
129.2		86.82
141.5	9.29	
148.6		81.27
167.8		68.19
169.5	28.82	
170.4		62.58
172	39.49	51.07
172.5	(47)	

C₆H₆O, Phenol

(3, 28, 42, 56, 76, 106, 110, 112, 117, 136, 143)

°C	% B	
0m	7.2	75.4
1.66mQ _B	7.3	75.2
10m	7.7	73.85
12.2Q*	7.8	73.5
15	7.95	73.0
20	8.2	72.1
25	8.45	71.05
30	8.75	69.9
35	9.1	68.5
40	9.6	66.8
45	10.45	65.0
50	11.8	62.6
55	13.8	59.2
60	16.8	55.1
65	23.9	45.8
66.0	34.0	

* Solid = B₂A.**C₆H₇N, Aniline**

(2, 3, 50, 55, 68, 107, 117, 131, 151)

- 0.62Q _A	3.28	95.64
+10	3.38	95.18
15	3.43	95.06
20	3.49	94.93
25	3.55	94.77
30	3.63	94.62
40	3.83	94.29
50	4.05	93.86
60	4.40	93.4
70	4.91	92.75
80	5.59	91.95
90	6.36	91.0
100	7.18	89.7
110	7.95	88.05
120	9.15	86.0
130	11.05	83.6
140	13.6	80.6
150	17.0	76.4
160	23.9	69.1
165	(30.6)	(61.8)
167.5	(46.16)	

C₆H₇N, β -Picoline (36)

49.4	26.4	
51.4		35.5
53.7		42.3
54.5	16.4	
61.0	12.7	
63.3		52.3
83.5		59.7
125.7	12.7	
133.3		59.7
140.0	16.4	
146.5		52.3
151		42.3
152		35.5
152.5	26.4	

C₆H₈N₂, Phenylhydrazine (7)

19.8	11.6	60.1
55.2	33.6	

H_2O .—(Continued)		
$\text{C}_6\text{H}_{10}\text{O}_3$, Ethyl acetoacetate (79)		
$^{\circ}\text{C}$	Wt. B/l soln.	
16–16.5	12.5	
$\text{C}_6\text{H}_{12}\text{O}_2$, Isoamyl formate (148)		
$^{\circ}\text{C}$	% B	
22	0.3	
$\text{C}_6\text{H}_{12}\text{O}_2$, Isobutyl acetate (148)		
22	0.5	
$\text{C}_6\text{H}_{12}\text{O}_2$, Ethyl butyrate (148)		
22	0.5	
$\text{C}_6\text{H}_{12}\text{O}_2$, Propyl propionate (103)		
0	1.05	
10	0.84	
20	0.68	
30	0.60	
$\text{C}_6\text{H}_{12}\text{O}_3$, Paraldehyde (100)		
10	12.9	99.15
20	10.4	98.9
30	8.75	98.7
40	7.65	98.45
50	6.85	98.1
60	6.30	97.7
70	5.95	97.3
80		96.8
$\text{C}_6\text{H}_{13}\text{N}$, 1-Methylpiperidine (35)		
48.3	16.7	
48.5		21.3
48.7	13	26.9
49.5		37.2
50.3	10.3	
51.2		46.3
54.1	8.0	
55		55.9
61.5		65.3
63.6	6.4	
69.5	5.8	
70.0		74.2
77	5.3	
85.5		83.4
112		89.6
176		89.6
178	5.3	
196	8.8	
230		83.4
236	13.5	
$\text{C}_6\text{H}_{13}\text{N}$, 2-Methylpiperidine (37)		
79.3	19.4	
79.8	13.8	
80.4	10.6	
81		24.0
82.4	9.5	
83		29.2
86.5	8.6	
87		39.7
87.2		33.7
88.8		47.0

$\text{C}_6\text{H}_{13}\text{N}$.—(Continued)		
°C	% B	
92.4	7.8	
94		52.4
112		64.7
165		72.3
171	8.2	
188	9.7	
220	15.0	
221		60.4
225		52.4
227	20–28	
$\text{C}_6\text{H}_{13}\text{N}$, 3-Methylpiperidine (36)		
°C	% B	
56.9	19.2	
57.5		29.2
58.1	9.9	
59.9		38.1
69.8		50.5
80	4.8	
82		58.2
115		70.1
142.2		74.8
143	4.8	
184		74.8
197	9.9	
204		70.1
226.5		58.2
228.5	19.2	
232		50.5
234		38.1
235	29.2	
$\text{C}_6\text{H}_{13}\text{N}$, 4-Methylpiperidine (36)		
°C	% B	
84.9	23.7	
85.1	16	
85.9		30
87.6	11.6	
88.8		36.2
94.2	8.9	
95.5		42.4
106.9		49.4
122.7		55.0
133.0		57.5
146.0	8.9	
157.8	11.6	
168.5		57.5
178.0	16.0	
183.6		49.4
186.2	23.7	
187.5		42.4
188.8		30.0
189.5	36.2	
$\text{C}_6\text{H}_{14}\text{O}_2$, Acetal (95, 137)		
°C	% B	
25	4.4	
$\text{C}_6\text{H}_{14}\text{O}_2$, Ethylene glycol mono- <i>n</i> -butyl ether (19)		
°C	% B	
49.1	24.8	
50	18.2	34.4
52	14.4	41.5
55	12.5	47.2
60	10.9	51.6
70	9.4	56.2
80	9.2	58.0
100	10.2	57.3

$\text{C}_6\text{H}_{14}\text{O}_2$.—(Continued)		
°C	% B	
110	11.7	55.2
120	14.7	48.5
125	17.8	40.6
127	20.2	32.6
128	24.8	
$\text{C}_6\text{H}_{14}\text{O}_2$, Ethylene glycol mono- <i>isobutyl</i> ether (19)		
°C	% B	
24.5	24.6	
26	16.5	40.4
28	14.3	50.0
30	12.8	53.4
35	10.4	58.8
40	8.8	62.4
50	7.6	67.2
80	7.4	70.8
100	7.6	70.0
120	8.8	66.3
130	10.5	63.0
140	13.8	58.0
145	16.7	53.3
148	20.0	47.5
150.4	28	
$\text{C}_6\text{H}_{14}\text{O}_2$, 1, 2-Propylene glycol 1-propyl ether (19.5)		
°C	% B	
34.4	37	
36	24.7	52.4
40	19.6	61.2
50	14.8	70.0
60	12.6	73.0
80	10.5	75.0
100	10.4	75.2
120	10.5	74.3
140	12.3	71.0
150	14.0	67.9
160	17.0	62.0
165	19.5	58.0
171.8	37	
$\text{C}_6\text{H}_{14}\text{O}_2$, 1, 2-Propylene glycol 2-propyl ether (19.5)		
°C	% B	
42.6	35	
45	22.8	51.2
50	18.2	61.8
60	14.3	67.9
80	12.0	71.0
100	11.8	70.8
120	12.0	70.0
140	14.1	65.4
150	17.0	60.8
155	19.2	57.3
160	23.8	48.4
162	35	
$\text{C}_6\text{H}_{15}\text{N}$, Triethylamine (3, 46, 110, 143)		
°C	% B	
18.7	(50)	
20	14.0	81.0
25	7.15	95.4
30	5.55	
40	4.0	95.5
50	3.0	95.6
60	2.0	95.7
70	1.75	96

$\text{C}_7\text{H}_5\text{N}_2\text{O}_6$, 3, 5-Dinitrobenzoic acid (38)		
°C	% B	
87m	4.4	
96m		80.2
111.4m	10	
114m		67.4
120m		60
122Q _B	19.8	
122.6		50
123.6		40
123.8	30	
$\text{C}_7\text{H}_5\text{ClO}_2$, <i>o</i> -Chlorobenzoic acid (38)		
°C	% B	
97m	5.5	
104.3Q _B		
115.2		62.9
125.9	19.3	
126.0		48.7
126.2	34.9	
$\text{C}_7\text{H}_5\text{ClO}_2$, <i>m</i> -Chlorobenzoic acid (38)		
°C	% B	
116m		75.8
122m	4.2	
123.7Q _B		
136		60.2
142	18.9	
142.6		51.3
142.8	34.3	
$\text{C}_7\text{H}_5\text{NO}_3$, <i>o</i> -Nitrobenzaldehyde (128)		
°C	% B	
39.7Q _B		99.9
63.8		99.0
66.9	0.70	
103.1	1.53	
113.5		96.49
145.1		94.80
161.7		93.56
166.0	4.75	
$\text{C}_7\text{H}_5\text{NO}_3$, <i>m</i> -Nitrobenzaldehyde (128)		
°C	% B	
51Q _B		99.6
60		99.2
80	1.2	98.2
100	1.65	97.1
120	2.1	96.0
140	3.2	94.3
160	5.4	91.6
180	10.2	86.4
200	18.4	74.8
210	31	62.0
212	(46)	
$\text{C}_7\text{H}_5\text{NO}_3$, <i>p</i> -Nitrobenzaldehyde (128)		
°C	% B	
97.1Q		98.2
132.4	2.91	
134.2		96.70
164.6		92.74
172.6		90.65
176.5	8.78	
205.4	20.67	
213.4		63.19
215.5	37.77	
216	(47.5)	

C₇H₅NO₄,* *o*-Nitrobenzoic acid (38)

°C	% B	
46.2	10	
51.6	20	49.5
52.0	29.8	39.4

C₇H₅NO₄, *m*-Nitrobenzoic acid (3, 38, 129)

°C	% B	
76.7Q _B	5.0	69.75
80	5.3	69.0
85	5.8	67.6
90	6.8	65.5
95	8.1	62.5
100	10.6	58.8
105	16.0	52.7
108.3	(34)	

C₇H₆O, Benzaldehyde (39)

Room	0.3	
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C₇H₆O₂, Benzoic acid (3, 129)

°C	% B	
64m	3.04	
75m	3.9	
80m	4.2	(79.7)
85m	4.8	(78)
95Q _B	7.0	72.8
100	7.8	69.0
105	9.2	64.0
110	13.2	57.2
115	23.6	45.2
116.2	34	

C₇H₆O₂, *o*-Hydroxybenzaldehyde (126)

°C	% B	
67.4		97.13
85.8	1.68	
118.3		93.20
136.5	3.59	
146.3		90.56
154.0	5.34	*

C₇H₆O₂, *m*-Hydroxybenzaldehyde (126)

°C	% B	
(59)Q _B	(11.2)	(60.0)
62.4		53.9
63.5	19.2	
65.6		43.4
66.0	29.2	
66.1	31.9	
66.2	(35)	

C₇H₆O₂, *p*-Hydroxybenzaldehyde (126)

°C	% B	
52.8m	13.2	
60.5m	20.7	
61.8m		49.8
62.4m	26.6	
62.8Q _B	27.4	46.2
63.8		42.2
64.4	(36.5)	

C₇H₆O₃,* *o*-Hydroxybenzoic acid (salicylic acid) (3, 38, 129)

°C	% B	
65	5.1	65.9
70	6.0	63.9
75	7.1	61.6
80	8.7	58.1
85	13.0	52.0
89.1	(32)	

* The two-liquid system is meta-stable throughout.

C₇H₇NO₂,* *o*-Aminobenzoic acid (38)

°C	% B	
62.4	9.9	
73.0		67.0
74.6	13.5	
75.8		59.4
78	30.6	49.4
78+	38	

* The two-liquid system is meta-stable throughout.

C₇H₇NO₂, *o*-Nitrotoluene (14)

°C	% B	
138		97.79
164	2.17	
197		91.90
205	5.97	
222		85.36
230	13.33	
231		82.05
237		77.21
238	20.77	
242	29.93	
243		69.21
245	(51)	

C₇H₈, Toluene (60)

°C	% B	
150	0.174	
200	0.605	
250	2.38	
300	10.1	

C₇H₈O, *o*-Cresol (133)

°C	% B	
8Q _B	2.5	87.0
20	2.7	86.4
30	2.9	85.9
40	3.1	85.4
50	3.25	84.85
60	3.4	84.4
70	3.75	83.8
80	4.25	83.0
90	4.6	82.1
100	5.1	80.95
110	5.7	79.6
120	6.3	78.0
130	7.0	76.0
140	9.5	72.2
150	14.9	65.5
160	26.5	52
162.8	(39.2)	

C₇H₈O, *m*-Cresol (133)

°C	% B	
0.0	2.2	88.6
10	2.3	87.8
20	2.35	87.0
30	2.4	86.2
40	2.55	85.4
50	2.7	84.5
60	2.95	83.5
70	3.35	82.3
80	3.8	80.95
90	4.4	79.6
100	5.1	77.4
110	5.9	75.2
120	7.0	72.0
130	8.8	68.3
140	12.2	62.0
145	22.0	50.2
147	35.5	

C₇H₈O, *p*-Cresol (133)

°C	% B	
8.7Q _B	2.0	85.85
20		85.0
30		84.25
40	2.25	83.4
50	2.4	83.0
60	2.70	81.5
70	3.05	80.3
80	3.50	79.1
90	4.1	77.4
100	4.85	75.0
110	5.70	72.3
120	6.75	69.0
130	8.60	64.2
140	16.0	53.8
142	20.8	49.4
143.5	(34)	

C₇H₉N, 2, 6-Dimethylpyridine (36)

°C	% B	
45.3	27.2	
50	16.3	46.0
60	11.4	55.2
70	9.8	60.9
80	9.3	64.2
100	9.4	67.2
120	10.5	67.2
130	11.7	66.9
140	13.4	65.1
150	16.5	60.8
155	18.9	56.7
160	21.2	49.7
164.9	33.8	

C₇H₉N, *p*-Toluidine (156)

°C	% B	
44	1.775	
57.5	2.04	
69	2.345	

C₇H₁₂, Heptene (49)

°C	% B	
17	0.211	
40	0.038	

C₇H₁₄O, Heptaldehyde (49)

°C	% B	
0	0.303	
20	0.234	
40	0.188	

C₇H₁₄O₂, Heptylic acid (49)

°C	% B	
20	0.29	

C₇H₁₅N, 1-Ethylpiperidine (35)

°C	% B	
7.45	30	
8	14.2	47.0
9	11.8	52.0
10	10.5	57.0
15	7.4	73.4
20	5.8	82.3
30	4.0	90.1
40	2.9	92.9
50	2.2	93.9
60	1.8	94.8
70		95.4

C₈H₆O₂, *o*-Phthalic aldehyde (120)

°C	% B	
45.4Q _B	4.94	86.85
57.0		88.16
60.0	4.54	

C₈H₆O₃,* *o*-Aldehydobenzoic acid (127)

°C	% B	
21.1	9.38	
39.2		59.48
43.3	20.0	
44		40.83
45.75	29.2	

* The two-liquid system is meta-stable throughout.

C₈H₃N₂O₃, *o*-Nitroacetanilide (132)

°C	% B	
81.0Q _B		96.0
99.0		94.54
110.2		93.65
120.0	3.97	
157.6	8.04	
173.1		83.47
179.2	11.97	
188.0		76.28
191.2	24.06	
195		65.04
197	41.16	
198	(49.2)	

C₈H₃N₂O₃, *m*-Nitroacetanilide (132)

°C	% B	
118.5Q _B		90.0
130.0	5.21	
149.2		81.18
163.5	14.52	
166.4		73.74
175.7		66.03
176.9	31.13	
180	(45.6)	

C₈H₃N₂O₃, *p*-Nitroacetanilide (132)

°C	% B	
161.5Q _B		80
164.2	14.36	
171.7		65.84
172.8	25.62	
176.6		54.93
177.4	42.65	

C₈H₈O₂, Phenylacetic acid (129)

°C	% B	
45.5Q _B		
84.7	5.65	
94.8		61.94
106.8		39.69
108.0	20.00	

C₈H₈O₂, *o*-Toluic acid (38, 133)

°C	% B	
94Q _B	2.5	91.2
100	2.8	90.0
110	3.8	87.5
120	5.4	84.9
130	6.9	81.2
140	9.2	76.1
150	13.5	67.6
155	18.7	59.6
157.5	23.8	54.8
160.7	(37.6)	

H₂O.—(Continued)**C₈H₈O₂, *m*-Toluic acid**
(38, 133)

°C	% B	
92.5Q _B	1.6	90.4
100	2.0	88.3
110	2.6	85.4
120	3.2	82.5
130	4.0	79.5
140	5.9	75.0
150	8.0	68.3
160	18.8	52.7
161.9	(35)	

C₈H₈O₂, *p*-Toluic acid
(38, 133)

142.5Q _B	5.0	73.8
145	6.2	70.9
150	9.4	64.8
155	15.1	57.5
157	18.8	51.4
158.9	35	

C₈H₈O₂, 4-Hydroxytoluene-3-aldehyde (126)

87.7		96.09
99.1	2.52	
137.1		92.73
156.5	5.47	

C₈H₈O₂, 6-Hydroxytoluene-3-aldehyde (126)

79.5Q _B	3.0	(59.9)
87.2		56.0
99.3	5.45	
127	16.5	52.5
133.5	23.5	
136.8	35.4	

C₈H₈O₂, 5-Hydroxytoluene-2-aldehyde (126)

69.1Q _B	6.9	50.6
78.8		50.3
85.8	7.95	
116.3	14.3	
121.1		48.5
124.5		44.6
125	34	

C₈H₈O₃,* *p*-Methoxybenzoic acid (38)

136	19.7	
137		50
137.6	30	
138.2	40	

* The two-liquid system is metastable throughout.

C₈H₈O₃, Methyl salicylate (121)

15-30	0.1	
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C₈H₈O₃, 2-Hydroxytoluene-3-carboxylic acid (129)

120.3		69.52
129.2Q _B		
131.8	5.07	
143.0		59.73
149.3	10.18	
151.3		50.51
153.3	29.81	
153.5	(31.5)	

C₈H₈O₃, 3-Hydroxytoluene-4-carboxylic acid (129)

°C	% B	
125.3	5.53	
131Q _B		
138.4	9.75	
139.4		54.40
144.6	19.89	41.46
145.2	(30.2)	

C₈H₈O₃, 4-Hydroxytoluene-3-carboxylic acid (129)

106.8	3.16	
107.8Q _B		
117.5	4.53	
117.7		69.29
120.2		67.91
131.5		59.85
135.6		55.16
138.5	10.21	
142.0		38.85
142.5	24.55	
142.8	(30)	

C₈H₉NO, Acetanilide (114)

83.2Q _B	5.2	87
86	5.4	
87		84.4
88		83.4
90	5.8	
91.5		81.9
95	6.1	
96		80.5
97.5	6.6	
118		80
127.5		75
134	20	
142	30	60
143.5	50	50
144	40	

C₈H₁₀, Xylene (60)

150	0.088	
200	0.307	
250	0.958	

C₈H₁₁N, 2, 4, 6-Trimethylpyridine (110)

5.7	17.2	
10	7.82	41.66
20	3.42	54.92
30	2.51	62.80
40	1.93	70.03
60	1.78	80.19
80	1.73	86.12
100	1.78	87.07
120	1.82	88.98
140	2.19	89.10
160	2.93	87.2
180	3.67	

C₈H₁₇N, 1-Propylpiperidine (35)

-3.0	3.2	
+0.5	2.7	
9.5		97.4
11	1.4	
15.5		97.9
30		98.4
32	0.6	

C₉H₈O₂, Allocinnamic acid
(91, 92)

°C	Wt. B/l soln.	
18	13.63	
25	14.43	
35	16.05	
45	18.11	
55	20.50	
65	23.43	
75	27.69	

C₉H₈O₄,* Acetylsalicylic acid (aspirin) (38)

°C	% B	
25	4.8	
50	7.0	
60	8.5	
70	9.7	67.5
80	13.8	60.0
85	18.5	52.5
87.4	20.0	50.0
89+	34	

* The two-liquid system is metastable throughout.

C₉H₁₀O₂, Hydratropic acid (129)

34Q _B		
101.5		80.30
119.9	5.00	
143.5		60.16
149.2	19.31	
150	39.31	

C₁₀H₁₄N₂, Nicotine

(58, 146, 149)

For vapor pressure, *v.* (124.5).

60.8	29	
65	14.8	51.2
70	12.1	63.0
75	10.3	70.9
80	9.0	75.9
85	8.1	79.1
90	7.4	80.5
100	7.1	81.2
125	7.5	81.3
150	8.0	81.2
175	10.0	77.0
190	12.9	68.4
200	16.3	56.5
205	20.4	48.0
208	32	

C₁₀H₁₈O, Cineole (30)

1.5	0.64	
7.5	0.57	
10	0.54	
21	0.35	
40	0.21	
50	0.19	

C₁₂H₁₁N, Diphenylamine (14)

150		97.3
175		95.5
200		93.2
230	1.5	90.0
250	2.0	88.0
270	4.4	85.6
290	11.6	77.2
300	22	66.2
303	44	

C₁₂H₁₃NO, Phenylammonium phenolate (3)

°C	% B	
40	4.0	91.1
50	4.5	89.2
60	5.2	87.4
70	5.9	85.6
80	6.6	83.8
90	7.3	82.1
100	8.0	80.3
110	9.5	77.7
120	12.7	73.2
130	18.4	65.3
135	24.2	58.6
140	41.2	

C₁₂H₁₇NO₄.H₂O, 3, 5-Dimethoxyacetophenetide (9)

35.6	4.13	
45.6	3.55	
58.1	3.28	
68.5	3.28	
84.3	3.55	
87Q _B		
99.8	4.16	
111.1	4.92	
118.4	5.50	
129.2	6.68	
173.6	22.89	

Ligroin (50)*d* = 0.6646

22	0.227	99.50
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Gasolene (18)*d* = 0.70; B. P. = 40-145°C

°C	% A
25	0.0098
35	0.0141
37.5	0.0160

Kerosene (American) (45)*d*₂₀²⁰ = 0.792; B. P. = 190-250°C

-2	0.0012
+18	0.005
23	0.007
30	0.008
36	0.012
53	0.026
59	0.031
61	0.035
66	0.043
79	0.063
85	0.075
94	0.097

Paraffin oil (45)*d*₁₅¹⁵ = 0.883; B. P. = 200-300°C
at 10 mm.

16	0.003
50	0.013
65	0.022
73	0.030
77	0.035
94	0.055

VARIATION OF THE CRITICAL SOLUTION TEMPERATURE (°C) WITH PRESSURE (146)

B-component	°C	kg/cm ²	$\frac{\Delta t}{\Delta p}$
CH ₃ NO ₂ , Nitromethane.....	103.3	1-150	-0.008
C ₃ H ₅ N, Propionitrile.....	111.0	5-165	-0.02
C ₃ H ₈ O ₂ , Methylal.....	160.3	20-64	-0.21
C ₄ H ₄ N ₂ , Succinonitrile.....	52.3	10-160	-0.003

C₄H₈O, Methyl ethyl ketone
Lower *t*

°C	kg/cm ²	$\frac{\Delta t}{\Delta p}$	°C	kg/cm ²	$\frac{\Delta t}{\Delta p}$
-13.8	78.2		37.3	700	0.071
-6.1	150	0.107	44.1	800	0.068
-0.7	225	0.091	51.3	900	0.072
+7.8	300	0.095	61.6	1000	0.103
16.05	400	0.083	66.9	1050	0.106
23.2	500	0.072	80	1085	
30.2	600	0.070			

Upper *t*

°C.....	141	136.8	132.8	86.5
kg/cm ²	10	78.2	150	1075
$\frac{\Delta t}{\Delta p}$		-0.062	-0.052	-0.050

B-component	°C	kg/cm ²	$\frac{\Delta t}{\Delta p}$
C ₄ H ₈ O ₂ , Isobutyric acid.....	26.4	1-525	-0.055
C ₄ H ₁₀ O, Isobutyl alcohol.....	134.2	10-180	-0.03
C ₄ H ₁₀ O, <i>sec.</i> -Butyl alcohol.....	113.8	1-800	-0.07
C ₅ H ₁₀ O ₂ , Isovaleric acid.....	95.0	5-60	-0.05
C ₆ H ₅ NO ₃ , <i>p</i> -Nitrophenol.....	94.3	1-120	+0.01
C ₆ H ₆ O, Phenol.....	66.09	10-1000	0.00456
C ₆ H ₇ N, Aniline.....	165	10-210	0.009
C ₆ H ₈ N ₂ , Phenylhydrazine.....	75.5 (sic)	5-155	-0.009
C ₆ H ₁₅ N, Triethylamine.....	18.35	5	
	22.36	200	+0.205
	29.19	600	0.171
	34.26	1000	0.127
	39.40	1500	0.103
	43.45	2000	0.080
C ₇ H ₄ N ₂ O ₆ , Dinitrobenzoic acid..	123.3	10-110	0.006
C ₇ H ₅ NO ₄ , <i>m</i> -Nitrobenzoic acid..	107.3	5-125	0.008
C ₇ H ₆ O ₂ , Benzoic acid.....	118.5	5-200	0.0025
C ₈ H ₁₁ N, 2, 4, 6-Trimethylpyridine	1.3	1-200	0.0045
C ₁₀ H ₁₄ N ₂ , Nicotine.....	61.3	1-200	0.01

Sec. 2. The key-formula of neither component begins with 16.
Standard arrangement (*v. p. viii*).

O ₂		
B = O ₃ (108, 119)		
°C	% A	
-158	Consolute temp.	
-183		30

SO ₂		
B = KI (155)		
°C	% B	
77.3		12
78	8.5	15.0
80	6.8	17.6
84	4.5	21.1
88Q _B	2.7	24.0

NH ₃		
B = Na (70, 111)		
°C	% B	
-72		16.6*
-65		13.6*
-60	2.15	10.9
-55	2.5	10.0
-50	3.0	8.9
-46	3.6	7.8
-42	4.7	6.2
-41.6		5.4

* According to (111).

NH ₄ Cl		
B = AlCl ₃ (65)		
°C	% A	
192.5Q†	0.08	94

NH ₄ Br		
B = AlBr ₃ (65)		
°C	% A	
98Q†	>0.092	9.0
159.5		8.7
160.5	0.093	
236.5	0.30	

SbCl ₃		
B = SnCl ₂ (65)		
°C	% B	
243.1Q†	1.2	89.6
B = SnCl ₄ † (65)		
62.9	39.1	
63.0		67.9
64.5		64.4
65.4		56.4
65.9	48.7	

SnCl ₂		
B = AlCl ₃ (65)		
°C	% A	
192.0Q†	2.1	19.1

SnBr ₂		
B = AlBr ₃ (65)		
°C	% B	
161.0 Q _{AB2}	1.9	14.7
169.1	2.2	
185.4		13.7
187.3	3.5	
198.0	4.9	
201.4		11.1
202.4		10.7
204.5	8.7	

PbBr ₂		
B = AlBr ₃ (65)		
°C	% B	
210.4Q _{AB2}	1.1	21.0

TiCl		
B = AlCl ₃ (65)		
°C	% B	
192.0Q†	2.1	23.6

TiBr		
B = AlBr ₃ (65)		
°C	% B	
103.9Q†	>0.64	23.9
118	0.64	23.5
260		22.5

HgBr		
B = AlBr ₃ (65)		
°C	% B	
238.1Q _{AB}	1.9	34.9
275.5	3.5	

† Solid = double compound.

‡ The two-liquid system is metastable throughout.

Cu		
B = Cu ₂ S (43)		
°C	% A	
1150	3.7	94.8
1200	4.7	91.3
1300	7.2	91.0
1425	8.1	81.7
1485	7.2	79.9

Ag		
B = AgCl (104)		
°C	% A	
1000	0.1	

AgCl		
B = AlCl ₃ (65)		
°C	% A	
192.9Q*	0.75	18.6

AgBr		
B = AlBr ₃ (65)		
°C	% A	
105.9Q _{AB2}	1.2	12.6
120.4	2.2	
139.7		12.0
156.3	3.2	
159.7		10.8
161.9	3.6	
173.0		9.8
183.6	5.5	
186.0	7.1	

AlCl ₃		
B = BaCl ₂ (65)		
°C	% B	
191.5Q _{A2B}	3.1	18.9

NaCl		
B = NaCl		
°C	% B	
193.5Q*	0.09	8.8

KCl		
B = KCl		
°C	% B	
193Q*	0.22	11.1

AlBr ₃		
B = CaBr ₂ (65)		
°C	% B	
208.8Q*	0.6	10.9

BaBr ₂		
B = BaBr ₂		
°C	% B	
269.4Q _{A2B}	1.0	17.5

NaBr		
B = NaBr		
°C	% B	
95.4Q*	1.0	7.0
110.9	1.2	
125.6		6.5
166.4	1.6	
166.9		6.1
202.7		5.4
222.1	2.2	
230		4.3
231.9	3.2	
232	3.25	

KBr		
B = KBr		
°C	% B	
98.1Q*	0.18	11.2
189.6		9.7
265.9	0.39	

* Solid = double compound.

Sec. 3. The A-component key-formula does not begin with 16. The B-component key-formula begins with 16. A-components in standard arrangement; B-components in C-arrangement (v. p. viii).

S		
B = C ₄ H ₅ NS, Mustard oil (3)		
°C	% B	
80		73.4
90	10.5	69.8
100	13.0	66.0
110	16.8	60.8
120	23.6	51.4
125		36.5

B = C ₆ H ₅ Cl, Chlorobenzene		
67		81.2
90	15	69.6
100	20.5	63.6
110	27.3	55.7
117		42

B = C ₆ H ₆ , Benzene		
86		78.5
100	8.0	74.5
110	10.0	71.2
120	11.8	68.0
130	13.6	64
140	15.6	59.7
150	18.0	53.9
160	25.9	43.7
162.8		34.8

B = C ₆ H ₇ N, Aniline		
72		85.9
100	6.0	76
110	8.6	71.2
120	11.3	64.7
130	15.4	54.5
135	20.3	45.2
138		31

B = C ₇ H ₈ , Toluene		
°C	% A	
50	22	
100	30	94.0
110	31.6	93.0
120	33.6	91.8
130	35.8	90.5
140	38.8	88.7
150	43.5	86.4
160	49.0	83.7
170	56.0	80.2
179.5		70

SO ₂		
B = C ₆ H ₁₂ , Cyclohexane (69)		
-17Q _A	9.0	96.0
-10	11.5	94.0
-5	13.7	92.8
0	16.7	91.0
+5	22.7	87.2
10	31.7	78.4
12	38.5	72.1
13.5		55.6

B = C ₆ H ₁₄ , n-Hexane (123)		
-73.5Q _A		99.2
-60		99.0
-30	11.3	97.2

B = C ₆ H ₁₄ —(Continued)		
°C	% A	
-20	15.5	96.7
-10	20.7	96.1
0	27.3	95.6
+5	34.2	95.4
8	42.0	94.0
10.1		71

B = C ₈ H ₁₈ , n-Octane (162)		
B = C ₁₆ H ₃₂ , Cetene (124)		
-2.2Q _B	12.0	97.1
0.0	13.6	97.0
+10.0	21.2	96.7
20.0	30.4	96.0
30.0	39.8	94.0
35.0	44.7	92.0
40.0	52.8	87.8
42.0	59.0	84.0
42.7		72.0

NH ₃			
B = C ₈ H ₁₀ , m-Xylene (71)			
°C	% A		p _{atm.}
-33.5	1.73	96.61	1.0
+8	17.36	70.09	5.5
10	19.63	65.46	5.8
12	22.04	60.43	6.2
14	29.00	52.89	6.7
14.7		41.23	6.85

P ₄			
B = CS ₂ (51)			
°C	% A		
-7.8	9.4		85.2
-6.7	46.1		82.3
-6.6	50.3		77.9
-6.5	55.6		70.3
-6.4	62.0		
-6.38*		65.7	

* -6.5° (51).

B = C ₂ H ₄ Br ₂ , Ethylene bromide (51)		
151.7	77.9	
162.0	52.9	
163.0	36.9	
165.0	34.2	
165.5	45.6	
169.6	31.4	

Consolute temp. ca. 165°.

B = C ₆ H ₄ Br ₂ , p-Dibromobenzene (51)		
154.3	26.7	
159	33.1	55.3
161	36.4	52.3
163		45.1

B = C ₆ H ₄ Cl ₂		
p-Dichlorobenzene (51)		
Consolute temp. = 163°C		

B = C ₆ H ₅ Cl		
Chlorobenzene (51)		
Consolute temp. = 264°C		

B = C ₁₀ H ₈ , Naphthalene (51)		
°C	% A	
132.8	25.4	
190.0	44.2	79.7
195.0	47.6	78.0
200	52.8	75.0
202.7		64.3

B = C ₁₀ H ₂₂ , Decane (51)		
Consolute temp. = >300°C		

B = C ₁₄ H ₁₀ , Phenanthrene (51)		
°C	% A	
198		74.7
199.1		66.6
199.2	47.4	
199.5	49.5	
200		56.7

SbBr ₃		
B = C ₆ H ₁₂ , Cyclohexane (89)		
92.5	17.4	97.6
110	25.8	96.5
130	36.4	95.0
150	47.8	92.7
170	62.3	86.3
175		74.0

SbCl ₃		
C ₆ H ₁₂ , Cyclohexane (88, 89)		
70	13.7	97
80	19.5	96.1
100	32.3	92.7
120	57.1	83.2
124	58.9	76.7
125.5		68

MgBr ₂		
B = C ₄ H ₁₀ O, Ethyl ether (87)		
°C	% B	
-10	58	98.2
0	59	97.7
+10	59.9	97.2
20	60.7	96.7
22.8Q*		
30	61.3	96.2
40	61.8	95.7
50	62.2	95.3
60	62.4	94.9
70	62.4	94.6
80	62.3	94.4
90	62.1	94.3

MgI ₂		
B = C ₄ H ₁₀ O, Ethyl ether (87)		
14.8	64.5	
18.6		86.43
20.0	64.2	
23.6Q*		
24.4		85.4
28.4	64.5	
32.4		84.18
33.0	64.3	
37.3		80.6
38.0	67.2	
38.5		72.5

* Solid = AB₂.

VARIATION OF THE CRITICAL SOLUTION TEMPERATURE (°C) WITH PRESSURE (146)

Components	°C	kg/cm ²	$\frac{\Delta t}{\Delta p}$
S			
B = C ₆ H ₅ Cl, Chlorobenzene.....	117	5-85	-0.025
SO ₂			
B = C ₆ H ₁₄ , Hexane.....	11.9	10-130	-0.023
B = C ₁₀ H ₂₂ , Diisooamyl.....	34.1	10-130	+0.03

Sec. 4. Both A- and B-component key-formulae begin with 16. C-arrangement for both components (v. p. viii).

CCl ₄		
B = CH ₂ O ₂ , Formic acid (44)		
°C	% A	
25	6.5	96.7

CS ₂		
B = CH ₂ O ₂ , Formic acid (44)		
25	4.45	98.7

B = CH ₄ O, Methyl alcohol (26, 86, 110)		
-73.6	18.7	
-38.7	28.8	
-18.85		99.64
-4.43	41.3	
+6.46		98.74
10	47.7	98.4
15	50.2	97.9

B = CH ₄ O—(Continued)		
°C	% A	
20	53.3	97.2
25	57.3	96.0
30	62.7	94.0
35	72.7	88.9
36.5		80.8

B = C ₂ H ₆ O, Ethyl alcohol (47, 72, 86)		
-108.04		99.09
-100	32.0	99
-80	38.5	98.7
-60	46.7	98.0
-40	57.4	96.1
-30	67.1	93.0
-25	76.3	87.6
-24.3		82.3

CHBr₃		
B = CH ₂ O ₂ , Formic acid (44)		
°C	% A	
25	20.2	97.8

CH₂O₂		
Formic acid		
B = C ₆ H ₆ , Benzene (33)		
°C	% B	
3.8	10.2	
25	14.1	90.4
30	15.1	89.6
40	17.8	87.0
50	21.0	83.4
60	25.7	77.9
70	35.1	68.6
73.2	51.8	

(44)		
°C	% A	
25	13.1	87.3

B = C ₇ H ₈ , Toluene (44)		
°C	% A	
25	9.9	91.6

B = C ₈ H ₁₀ , Xylene (44)		
°C	% A	
25	8.04	93.2

B = Kerosene (44)		
°C	% A	
25	0.89	98.4

B = Cottonseed oil (44)		
°C	% B	
25	0.76	92.0

CH₃I		
Methyl iodide		
B = C ₅ H ₅ N, Pyridine (4)		
°C	% A	
78.4m	32.17	
79m	29.23	
80.4m	23.92	
81.0Q*		
86.6	16.94	
87.0		37.31
117.0		42.90

* Solid = AB.

CH₄O		
Methyl alcohol		
B = C ₆ H ₁₂ , Cyclohexane (75, 92.5)		
°C	% B	
16	31	
21.8		95.9
29.0	38.3	
38.5		91.0
39.9	50.6	
47.0		81.3
47.2	62.7	
48.2		77.6
49.1	71	

B = C ₆ H ₁₄ , Hexane (110)		
°C	% B	
10	26.5	96.8
20	31.6	95.9
25	34.7	95.1
30	38.3	93.7
35	43.6	91.2
40	52.7	85.5
42.6	68.9	

B = Cottonseed oil (44)		
°C	% B	
25	7.79	95.0

C₂H₄O₂		
Acetic acid		
B = Kerosene (44)		
°C	% A	
25	17.8	88.8

B = Cottonseed oil (44)		
°C	% B	
25	5.3	64.2

C₂H₆O		
Ethyl alcohol		
B = C ₄ H ₄ N ₂ , Succinonitrile (116)		
°C	% A	
13.4Q _B	20.2	
13.5		87.5
19.3	25.0	
20.0		84.0
24.6		80.1
28.2		75.1
29.2	39.8	
30.8	51.1	
31.2	59.2	

B = C ₄ H ₈ Cl ₂ S, Di-(2-chloro-ethyl) sulfide (mustard gas) (139)		
°C	% B	
6	45.3	
7	46.6	
8	48.3	
9	50.4	
10	52.9	
11	56.0	
12	59.7	
13	64.1	
14	69.1	94.2
15	75.9	90.1
15.6	83.5	

B = C ₄ H ₁₀ , n-Butane (73)		
Consolute temp. = 37.5°C		

B = C ₅ H ₁₂ , Isopentane (73)		
Consolute temp. = -30°C		

B = C ₇ H ₅ N ₅ O ₈ , 2, 4, 6-Tri-nitrophenylmethylnitramine (20.1)		
Consolute temp. = 105°C		

B = C ₇ H ₅ N ₃ O ₆		
Trinitrotoluene (20)		
Consolute temp. = 96.5°C		

B = Cottonseed oil (161)		
°C	% B	
25	8.45	81.3

C₂H₆O₄S		
Dimethyl sulfate		
B = Turpentine oil (29)		
°C	% A	
25.2	2.80	
38.0		93.99
50.3	5.28	

B = Turpentine oil.—		
(Continued)		
°C	% A	
74.0	10.16	88.53
94.8	19.50	
95.3		80.54
101.9	27.79	
104.4		68.90
105.6	33.89	
107.9		57.44
108.2	50.22	

C₃H₆O		
Acetone		
B = C ₃ H ₈ O ₃ , Glycerol (84)		
°C	% A	
10	10.9	
20	12.3	
30	13.7	
40	15.1	89.6
50	16.8	88.6
60	19.0	86.4
70	21.3	83.0
80	25.1	78.0
90	34.0	69.8
95	44.0	59.5
95.7	51.7	

C₃H₈O₃		
Glycerol		
B = C ₄ H ₈ O		
Ethyl methyl ketone (84)		
°C	% B	
40	4.0	
50	4.5	92.2
60	5.2	91.8
80	6.8	90.2
100	8.6	89.4
120	9.8	88.0
130	11.4	84.0
140	13.6	80.4
150	17.0	78.6
160	32.0	64.4
164.5	48.4	

B = C ₆ H ₁₂ O, Isoamyl alcohol (84)		
°C	% A	
20	2.6	81.8
30	4.7	78.5
40	6.8	75.2
50	8.9	70.7
60	11.0	63.8
70	17.2	53.2
74.2	34	

B = C ₇ H ₆ O, Benzaldehyde (85)		
°C	% A	
67.5	4.5	
85.5		97.0
90	5.2	96.6
100	7.2	95.6
110	9.0	94.1
120	11.6	92.1
130	16.2	89.2
140	21.1	85.3
150	27.7	79.5
155	33.9	73.7
160	48.0	60.0
160.7	54.1	

B = C ₇ H ₆ O ₂ , Salicylaldehyde (85)		
°C	% A	
100		92.8
110	3.2	90.8
120	4.7	88.7
130	6.3	86.6
140	8.0	84.2
150	10.0	81.3
160	13.6	77.0
170	22.2	68.0
175	30.0	59.8
176.6	44.8	

B = C ₇ H ₈ O, Anisole (85)		
°C	% B	
160	5.6	
180	10.1	
200	14.6	
220	19.2	
240	24.2	87.7
260	31.5	80.7
270	38.2	73.8
275.5	56	

B = C ₇ H ₅ O ₂ , Guaiacol (85)		
°C	% A	
39.5	44	
40	37.2	52.0
45	28.5	66.6
50	25.2	69.5
55	23.7	70.4
60	23.5	70.7
65	24.1	70.4
70	25.6	69.4
75	28.3	67.3
80	32.5	61.8
82	35.7	54.0
83.5	43	

B = C ₇ H ₉ N, Methylaniline (99)		
°C	% A	
190		85.5
200	11.2	84.3
210	15.4	79.9
215	19.5	75.3
220	26.5	67.4
224.5	46	

B = C ₇ H ₉ N, o-Toluidine (99)		
°C	% A	
100	7.8	87.6
110	8.8	86.8
120	10.7	85.2
130	13.9	82.2
140	18.4	77.2
150	26.6	69.7
154.4	47.2	

B = C ₇ H ₉ N, m-Toluidine (99)		
°C	% A	
6.7	46	
10	28.0	69.5
20	19.5	84.4
30	16.6	86.7
40	16.0	87.2
50	16.0	87.6
60	16.0	87.0
70	16.0	86.0
80	16.2	84.3
90	17.0	81.7

C₅H₈O₃—(Continued)B = C₇H₉N.—(Continued)

°C	% A	
100	19.8	77.8
110	25.4	71.2
115	29.5	66.2
120.5	47	

B = C₇H₉NO, *o*-Anisidine (99)

°C	% B	
141.0	34.25	73.09
142.5		
143.0	43.57	
144.5	51.69	
145.0	61.25	

B = C₈H₈O, Acetophenone (84)

90		97.2
100	4.7	96.4
110	5.6	95.6
120	6.7	94.3
130	8.0	92.6
140	9.7	90.4
150	11.8	87.9
160	14.6	84.5
170	18.4	79.3
180	26.3	70.2
185.5	48	

B = C₈H₁₀O₂, Monoethyl pyrocatechol (99)

172.5	20.0	
175	21.1	
180	23.8	82.6
185	27.6	76.3
190	33.5	68.0
192.9	49.5	

B = C₈H₁₁N, Dimethylaniline (99)

°C	% A	
200	8.0	
220	10.6	90.6
240	13.3	87.7
260	16.2	84.4
270	20.1	80.3
280	29.0	71.4
285	38.3	61.8
287	50	

B = C₉H₁₃N

Ethylbenzylamine (99)

°C	% B	
50	34	
60	5.8	72.8
80	3.6	86.8
100	3.5	88.8
140	4.4	88.2
180	6.5	86.2
220	11.6	84.2
260	21.5	81.5
270	26.5	79.2
275	31.0	77.5
281	56	

C₄H₈Cl₂S

Di-(2-chloroethyl) sulfide (mustard gas)

B = Ligroin (140)

B. P. = >100°C; $d_{24}^{24} = 0.6677$

°C	% A	
9.0Q _A	(31.5)	86.4
9.6		84.5
10.3	32.5	
12		82.6
14		80.9
14.5	39.3	
16	43.7	
17.22		76.1
17.5	49.4	
18.3	56.8	
19	(66)	

B = Gasolene (140)

B. P. = 60–180°C

4.2	30.08	
4.5	30.14	
7.3		87.34
7.8		87.17
9.0	36.46	
9.5	36.51	
13.5	46.21	
14	46.32	
18		77.53
18.7	53.49	
20.4	66.02	

B = Kerosene (140)

B. P. = 130–260°C

8.9		91.88
9.5	33.13	
14.2	39.79	
14.3		89.68
21.9		84.93
24.3		81.42
25	68.67	
25.6	75	

B = Railroad light oil (140)

B. P. = 160–300°C

9.3	21.64	
14.5	24.33	
20.9	29.88	
23.6	38.49	
25.0		90.78
28.0		88.74
31.3		86.58
33.0	47.95	
35	54.48	
37	63.8	

C₄H₁₀O

Ethyl ether

B = C₁₈H₁₂, Chrysene (12, 144, 145)

Consolute temp. = 207–218°C with 21% B in solution

Chlorinated mustard oil

B. P., 112° at 17 mm; $d_{20}^{20} = 1.355$

B = Railroad light oil (140)

B. P. = 160–300°C

°C

% A

–1	36	88.5
0	36.5	88
+1	37	87.5
2	38	87
3	39.5	86.5
4	42	85
5	44	84
6	48	82.5
7	55	80.5
8	(65)	(77)
8.3	(72.5)	

C₅H₁₀

Amylene

B = C₆H₇N, Aniline (69)

°C	% A	
–0.15	18.5	
+3.9		79.8
10.1		71.8
10.7	28.5	
14.15	39.6	
14.3		52.3
14.5	48.4	

C₅H₁₂

Isopentane

B = C₆H₅NO₂Nitrobenzene (144, 145, 146)
Consolute temp. = 32.6°C,
with 50.37% B in solution

°C	% B	
17.55	12.41	
26.60		91.87
29.35	16.95	
39.15		86.10
49.20	24.58	
54.95	28.46	
55.85		73.86
60.75	35.70	
62.25	45.33	
62.55		61.92
63.25		52.15
63.5	51.0	

B = C₁₂H₁₁N, Diphenylamine (13)

°C	% A	
15m	13.0	87.0
20m	16.4	84.7
25m	19.4	81.7
30m	22.5	80.2
35m	26.8	77.9
40m	33.8	72.0
41.9Q _B	37.2	68.9
42.5	40.3	67.4
44.9	54.2	

C₆H₅NO₂

Nitrobenzene

B = C₆H₁₄, Hexane (143, 145)

°C	% B	
–0.2	17.76	
+5.0		80.08
5.8	19.47	
14.0		70.94

B = C₆H₁₄—(Continued)

°C % B

15.5	29.72	
16.1		67.21
17.7	34.21	
18.7		57.29
21.02	48.43	

C₆H₆

Benzene

B = C₆H₆O₂, Resorcinol (110)

°C	% A	
40m	16.60	
50m	18.16	
60m	20.04	95.41
70m	22.46	93.36
80m	25.51	90.73
90m	29.02	87.20
95.5Q _B		
100	34.17	81.30
108.9	58.1	

B = C₆H₈N₂, *m*-Phenylenediamine (130)

53.8Q _B	25.00	
54.7	25.16	
55.5	25.44	
58.8	27.86	
59.8		80.64
60.0	28.96	
64.2	34.09	
66.5	38.40	
68.8	49.09	
69.0	60.96	

B = C₈H₁₀N₂O, *m*-Monoacetylphenylenediamine (130)

°C	% B	
184.9Q _B		77.5
188.4		76.86
193.4		76.16
201.9		74.65
227.8		68.90
228.5	22.75	
257.6		57.03
263.4	39.10	
265.1		49.23
265.5	44.31	
266	(46.4)	

B = C₈H₁₀N₂O, *p*-Monoacetylphenylenediamine (130)

146.8Q _B		74.0
147.1		72.71
150.1		71.05
155.9		67.66
163.5		63.07
170.0		59.95
180.8	17.36	
181.3		51.70
186.3		41.23
187.8	30.12	
188	(35.3)	

C₆H₆O

Phenol

B = C₆H₁₄, Hexane (14)

14.40	17.58	
20.75		88.57

B = C ₆ H ₁₄ .—(Continued)		
°C	% B	
29.20		83.94
31.70	26.11	
34.20	29.98	
37.00		68.78
37.65	40.20	64.96
38.65	41.64	
42.15	50.14	
42.5	51	
B = C ₇ H ₁₆ , Heptane (14)		
13.20	23.81	
14.45		79.36
17.95		74.02
20.05		65.41
22.05	33.31	
23.40	43.69	
23.50	45.8	
B = C ₈ H ₁₈ , Octane (14)		
19.65	14.0	
22.6	15.1	86.7
25	16.0	85.3
30	17.8	82.4
35	20.2	79.2
40	23.6	74.3
45	29.4	66.8
48	36.5	58.4
49.5	47	

C ₆ H ₆ O ₂ Resorcinol		
B = C ₈ H ₁₀ , <i>m</i> -Xylene (13)		
°C	% A	
60m	2.95	88.2
70m	3.80	87.1
80m	4.77	85.5
90m	6.35	83.9
100m	7.75	82.3
100.3Q _A	8.1	81.8
110	10.1	80.2
120	12.9	77.3
130	16.5	73.9
135	19.2	71.4
140	22.3	67.6
145	28.4	59.7
148.7	43.6	

C ₆ H ₇ N Aniline		
B = C ₅ H ₁₀ , Cyclopentane (17)		
Consolute temp. = 18°C		
B = C ₅ H ₁₂ , Pentane (17)		
Consolute temp. = 72°C		

C₅H₁₂, Isopentane (17)		
Consolute temp. = 77°C		
B = C₆H₁₂		
Methylcyclopentane (17)		
Consolute temp. = 35°C		
B = C₆H₁₄, Hexane (17, 26, 66)		
°C	% A	
20	7.2	
30	10.0	89.6
40	14.0	86.8
50	23.1	80.6
55	29.0	74.8
58	37.6	68.0
59.6*	52	
B = C₆H₁₄, Isohexane (17)		
Consolute temp. = 73.8°C		
B = C₇H₁₄		
Dimethylcyclopentane (17)		
Consolute temp. = 45°C		
B = C₇H₁₄		
Methylcyclohexane (17, 146)		
Consolute temp. = 35°C		
B = C₇H₁₆, Heptane (17)		
Consolute temp. = 70°C		
B = C₇H₁₆, Isoheptane (17)		
Consolute temp. = 72.8°C		
B = C₈H₁₆		
Dimethylcyclohexane (17)		
Consolute temp. = 49°C		
B = C₈H₁₈, Octane (17)		
Consolute temp. = 72°C		
B = C₈H₁₈, Isooctane (17)		
Consolute temp. = 74°C		

C ₁₀ H ₇ NO ₂ Nitronaphthalene		
B = Paraffin (14)		
°C	% B	
43.4	11.65	
54.0		94.52
59.0	16.65	
72.0		92.01
75.0	25.01	
76.0		91.32
90.0	36.10	
98.5	45.38	
99.0		83.97
101.0		74.33
102.0	54.54	
103.0		65.5

* 69° (17); *p* = ?.

VARIATION OF THE CRITICAL SOLUTION TEMPERATURE (°C) WITH PRESSURE

Components	°C	kg/cm ²	$\frac{\Delta t}{\Delta p}$
CO ₂ (146)			
B = C ₆ H ₅ NO ₂ , <i>o</i> -Nitrophenol.....	24.8	83-1275	0.33
CS ₂ (146)			
B = CH ₃ O, Methyl alcohol.....	48.5	5-85	0.015
B = C ₂ H ₆ O, Acetone.....	-39.5	10-110	0.01

Components	°C	kg/cm ²	$\frac{\Delta t}{\Delta p}$
CH ₂ O ₂ , Formic acid (146)			
B = C ₆ H ₅ Cl, Chlorobenzene.....	106.6	5-65	0.035
B = C ₆ H ₆ , Benzene.....	82	5-65	0.03
CH ₂ I ₂ , Methylene iodide (146)			
B = C ₂ H ₅ O, Ethyl alcohol.....	93.8	5-75	-0.004
B = C ₃ H ₇ O, Propyl alcohol.....	75.7	1-100	+0.006
B = C ₃ H ₈ O, Isopropyl alcohol.....	93.2	1-200	0.012
B = C ₄ H ₁₀ O, Isobutyl alcohol.....	77.5	1-80	0.012
B = C ₆ H ₁₂ , Cyclohexane.....	34.5	5-120	0.01
B = C ₆ H ₁₄ , Hexane.....	105.4	5-155	-0.02
B = C ₁₀ H ₂₂ , Diisoamyl.....	119.5	5-65	-0.015
CH ₃ O, Methyl alcohol			
B = C ₄ H ₁₀ , <i>n</i> -Butane (73, 146).....	16.6	20-150	+0.007
B = C ₄ H ₁₀ , Isobutane (146).....	20.1	10-140	0.004
B = C ₆ H ₁₂ , Cyclohexane (146).....	59.5	50-1000	0.0227
B = C ₆ H ₁₄ , Hexane (146).....	42.2	1-105	0.032
B = C ₁₀ H ₇ Br, Bromonaphthalene (146).....	62	5-195	-0.025
B = C ₁₀ H ₂₂ , Diisoamyl (146).....	86.8	10-150	+0.04
C ₂ H ₄ O ₂ , Acetic acid			
B = C ₁₀ H ₇ Br, Bromonaphthalene (146).....	42	5-210	0.025
C ₂ H ₅ O, Ethyl alcohol			
B = C ₄ H ₄ N ₂ , Succinonitrile (146)...	24.3	10-160	-0.005
C ₃ H ₅ N, Propionitrile			
B = C ₁₀ H ₂₂ , Diisoamyl (146).....	55.1	1-150	+0.016
C ₃ H ₆ O, Acetone			
B = C ₁₀ H ₂₂ , Diisoamyl (146).....	18	1-90	0.01
C ₄ H ₄ N ₂ , Ethylene cyanide			
B = C ₄ H ₁₀ O, Isobutyl alcohol (146)...	67.0	5-155	-0.004
C ₄ H ₁₀ , <i>n</i> -Butane (146)			
B = C ₆ H ₅ NO ₂ , Nitrobenzene.....	28.3	15-150	-0.04
B = C ₆ H ₇ N, Aniline.....	83	15-90	-0.08
C ₄ H ₁₀ O, Isobutyl alcohol			
B = C ₁₀ H ₇ Br, Bromonaphthalene (146).....	8.6	1-180	-0.01
C ₅ H ₁₀ , Amylene			
B = C ₆ H ₇ N, Aniline (146).....	21.8	1-165	-0.02
C ₆ H ₁₂ , Isopentane			
B = C ₆ H ₅ NO ₂ , Nitrobenzene (144, 146).....	32.6	1-300	-0.026
C ₆ H ₅ NO ₂ , Nitrobenzene			
B = C ₆ H ₁₄ , Hexane (143, 146).....	20.81	1-825	-0.008
	20.8	1-825	-0.01
B = C ₁₀ H ₂₂ , Diisoamyl (146).....	28.37	1-1225	-0.0011
B = Petroleum (146).....	13.95	1-725	+0.0014
C ₆ H ₆ , Benzene			
B = C ₆ H ₆ O ₂ , Resorcinol (146).....	109.1	10-170	-0.03
C ₆ H ₆ O ₂ , Resorcinol			
B = C ₈ H ₁₀ , Ethylbenzene (146).....	151.5	5-65	-0.025
C ₆ H ₇ N, Aniline			
B = C ₆ H ₁₂ , Cyclohexane (17, 146) ..	32.37	1.8-250	+0.0068
B = C ₇ H ₁₄ , Methylcyclohexane (146)	41.3	1-140	0.003
B = C ₁₀ H ₂₂ , Diisoamyl (146).....	82	5-180	-0.001
C ₇ H ₉ N, <i>m</i> -Toluidine			
B = C ₁₀ H ₂₂ , Diisoamyl (146).....	38.5	10-75	-0.003

LITERATURE

(For a key to the periodicals see end of volume)

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PHASE EQUILIBRIA FOR THREE-COMPONENT SYSTEMS CONTAINING TWO LIQUID PHASES, THE COMPLETE COMPOSITION OF AT LEAST ONE OF WHICH IS KNOWN

A. S. COOLIDGE

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Explanation of Diagrams and Tables

The data are presented by means of isothermal triangular diagrams with compositions in weight per cent (%).

For each of the two layers into which the system divides, a line can be drawn giving the composition of all mixtures capable of existing as such a layer. These lines may have various shapes. In the very common case that A and B are liquids of limited mutual solubility, but both soluble in all proportions in C, and supposing A to be denser than B, then the lower layer will give such a line as ab, Fig. 1, and the upper layer such a line as cd. If continued, the lines meet each other with a common tangent at the plait-point, o (see below). In another common case, in which A and B are completely miscible liquids and C is a solid very soluble in A but nearly insoluble in B, the two lines start together at the plait-point p, and run similar to pf and pg. In this case, they do not extend as far as the side, BC, of the diagram, but are terminated by the impossibility of producing solutions sufficiently

rich in C. However, supersaturation with regard to C may occur, without knowledge on the part of the experimenter, so that in many of the graphs representing systems of this class, points near f and g may not represent the most stable condition of the system. This can be settled in any case by consulting the section of I. C. T. dealing with equilibrium between solid and liquid phases in three-component systems. In a few cases, the binodal lines have different courses, running entirely separate across the diagram without plait-points, or forming closed curves with two plait-points.

Every point upon the line ab represents a solution in equilibrium with another solution, which must lie somewhere upon the line cd. This relation can be expressed graphically by plotting any one of the three triangular coordinates of the point on the line ab against any one of the coordinates of the corresponding point on the line cd. Practically, that coordinate is chosen, the lines representing which cut the binodal most nearly at right angles. Thus, in systems having binodals of the type abode, the % A in

the lower layer is plotted against the % B in the upper layer. The plot is made on the same diagram, which must be extended downwards, and gives the curve hko. The sides of the lower triangle are numbered downwards, the right side giving % A in lower layer, and the left % B in the upper layer. Thus h, the beginning of the conjugation curve, has the coordinates 92% A, 95% B, meaning that a solution of the lower layer containing 92% of A is in equilibrium with one of the upper layer with 95% of B, or, graphically, that points a and c of the binodals are conjugate. The conjugation curve crosses the binodals at the plait-point, o, where the two layers become identical. By plotting % A in the upper layer against % B in the lower layer, on the same diagram, a continuation of the conjugation curve, olm, is obtained above the binodal. This has the advantage of locating the plait-point by an interpolation, instead of the customary extrapolation.

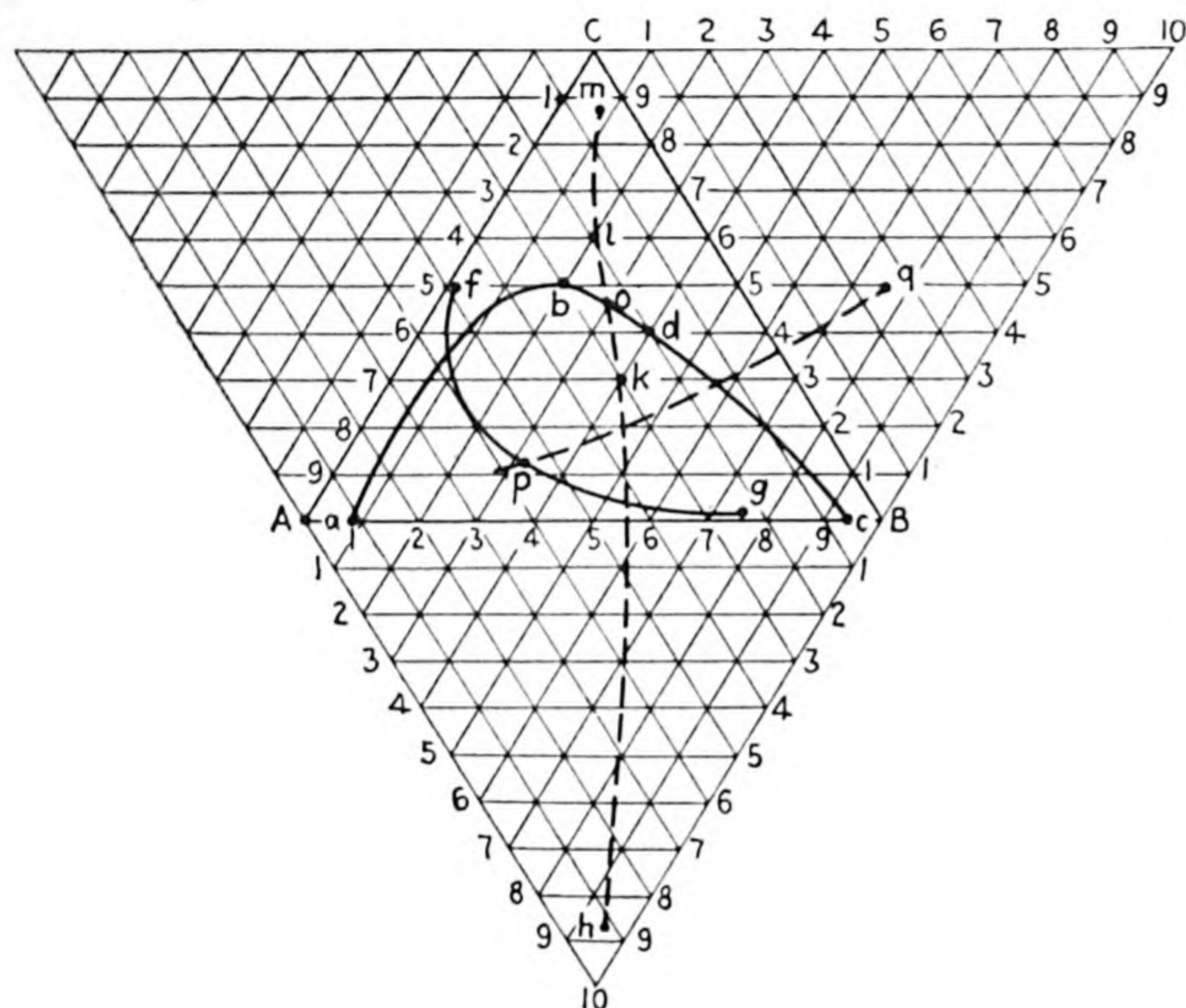


FIG. 1.

By the aid of the three lines just described, complete information can be read at once from the diagram, concerning composition of both phases, when a single datum (other than the temperature) is given. Thus, let it be required to find the equilibrium given that the lower layer contains 20 % of B. Running up from 2 on the lower scale of the upper triangle, and parallel to AC, we strike the binodal at b, and read at once $A = 30\%$, $C = 50\%$. Now running parallel to BC, we strike the conjugation line at k, from which, again running parallel to AC, we find the point d representing the solution of the upper layer in equilibrium, namely, 20 % A, 40 % B, 40 % C. Or, having found b, we can run up to l, then down to d, finding, of course, the same result.

In the case of systems having binodals like fpg, the conjugate line is constructed by plotting % C in the layer rich in C against % B in the layer rich in B, and has the general course of the line pq.

This method has several advantages over the customary one of drawing in numerous "tie-lines." First, it enables the phenomenon of conjugation to be represented as a continuous curve, from the smoothness of which the accuracy of the experimental data can be judged. It is found that in systems which have been accurately investigated, the conjugation line has only gentle curvature. Second, it makes possible the direct reading of any pair of conjugate points, without the necessity of interpolating between tie-lines, a matter of considerable difficulty and uncer-

tainty when the tie-lines have changing slopes. Finally, it greatly reduces the number of lines necessary to represent a given system, so that several systems may be shown together without risk of confusion. While either the long or the short branch of the conjugation curve is sufficient to determine all possible equilibria, readings can be made more accurately from the long branch, particularly when the initial parts of the binodals run nearly parallel to the sides of the triangle. However, in the majority of cases, the experimental data are so meager or unreliable that they can be expressed without further loss of accuracy by the short portion; this is therefore done, in order to save space. Where several systems are shown on the same diagram, the binodals are in general shown solid and the conjugation lines dashed, both being suitably labelled. Since all but a very few of the systems graphed belong to one or the other of the two classes illustrated in Fig. 1, there will be no difficulty in interpreting these graphs. In two or three cases where the binodals have different courses, conjugation is indicated by the customary tie-lines.

Temperature effects are generally small, and can be most practically represented by superposing on the same diagram, isotherms for a series of temperatures covering the (generally narrow) range for which data are available. In some cases, however, the range of temperatures investigated greatly exceeds that of compositions. In such cases the graphs show temperature directly as a function of concentration, under some other limiting condition explained on the graphs themselves. Such graphs do not show conjugation.

Where a graph of the largest permissible size would not give the data with sufficient accuracy, tables, interpolated from large graphs, are presented. In these tables the argument is usually the percentage of the predominant component in each layer, and the entries show the percentage of one other component in the same layer, and where known, of the predominant component of the conjugate layer. For example, the system given by lines *abode* and *hkolm* in Fig. 1, would be thus tabulated.

% A	% C	% (B) _C	% B	% C
30	50	40	40	40
.
.
.
92	0	95	95	0

Here, the first two columns give the compositions of solutions of the lower layer, the fourth and fifth, those of the upper layer; while the third, (B)_C, gives the percentage of B in the upper layer conjugate with each point of the lower layer. (In general, the entries under (B)_C will not be round numbers, and will not coincide with those under B in the second part of the table.) In many cases, the effect of temperature has been roughly determined, but a complete series of data is not available for more than one temperature. In such cases, approximate values for the temperature coefficient are appended. Thus, suppose that point b, A = 30%, B = 20%, C = 50%, is a point on the 20° binodal, but that at 30°C the binodal passes through A = 30%, B = 22%, C = 48%. This would be expressed in the statement $dC/dT = -0.2$ for A = 30%.

Wherever possible, the accuracy of the data has been estimated, and a value assigned to the probable error. In the graphs, the probable error is indicated by a single value, giving, in the scale of the diagram, the distance from the lines as drawn, within which the true lines probably lie. The estimate is made for the most sharply curved portions of the binodals, which are the most susceptible to errors. The straighter portions, especially when they lie close to the sides of the basic triangle, may generally be credited with a somewhat higher accuracy. In some cases where particular

parts of the curves are affected by errors greater than those assigned to the curve as a whole, they are drawn as wide bands, within which the true points probably lie.

The data on metallic systems require special discussion. They were made by a very rough method, and show great irregularities. In particular, the binodals often appear convex toward each other, with humps near the plait-point. In the domain of aqueous systems, such convexities and humps never appear in careful work. Bailey (4) states that their appearance is a delicate test for impurities. In the two or three aqueous systems in which they appear, they have, therefore, been eliminated in the graphs, and a large error has been assigned. However, it does not seem justifiable to carry this generalization over to the domain of metallic systems. The graphs have, therefore, been drawn as well as possible through the experimental points, but no attempt to estimate the reliability has been made.

METALLIC SYSTEMS

Sb-Bi-Zn, Fig. 2 (121)	Bi-Ag-Al, Fig. 5 (120)
Sb-Bi-Al, Fig. 3 (122)	Sn-Pb-Zn, Fig. 4 (119, 123, 124, 125)
Sb-Pb-Zn, Fig. 4 (121)	Sn-Pb-Al, Fig. 5 (120)
Sb-Pb-Al, Fig. 3 (122)	Sn-Cd-Al, Fig. 3 (122)
Bi-Sn-Zn, Fig. 2 (119, 125)	Pb-Zn-Cd, Fig. 4 (121)
Bi-Sn-Al, Fig. 5 (120)	Pb-Zn-Ag, Fig. 4 (119, 124)
Bi-Zn-Cd, Fig. 2 (121)	Pb-Ag-Al, Fig. 5 (120)
Bi-Zn-Ag, Fig. 2 (119, 125)	

AQUEOUS SYSTEMS

A-B-TABLE

H₂O

B = HCl

C = Br ₂ , Table 1 (83)
C = C ₄ H ₁₀ O, <i>n</i> -Butyl alcohol (85)
C = C ₄ H ₁₀ O, Ethyl ether, Fig. 14 (33, 99); <i>v. also</i> p. 419
C = C ₆ H ₆ O, Phenol, Fig. 35 (36, 37)
C = C ₁₀ H ₁₄ N ₂ , Nicotine, Fig. 6 (36, 37)

B = Br₂

C = HBr, Table 1 (10, 83, 116)
C = H ₂ SO ₄ (116)
C = CdBr ₂ (116)
C = HgBr ₂ , Table 1 (54)
C = SrBr ₂ , Table 1 (87)
C = NaCl, Table 1 (83)
C = Na ₂ SO ₄ , Table 1 (62)
C = NaNO ₃ , Table 1 (62)
C = KBr, Table 1 (10, 64, 116, 118)
C = K ₂ SO ₄ , Table 1 (62)

B = HBr

C = SO ₂ , Table 2 (3)
B = H ₂ SO ₄
C = C ₄ H ₁₀ O, <i>n</i> -Butyl alcohol (85)
C = C ₄ H ₁₀ O, Ethyl ether (41)
C = C ₆ H ₆ O, Phenol, Fig. 8 (36, 37, 53)

C = C ₆ H ₁₂ O ₃ , Paraldehyde (86)
B = NH ₃
C = K ₂ CO ₃ , Figs. 6 and 7 (82)

B = HNO₃

C = C ₄ H ₁₀ O, <i>n</i> -Butyl alcohol (85)
C = C ₄ H ₁₀ O, Ethyl ether (41)
C = C ₆ H ₅ NO ₂ , Nitrobenzene (42)

B = NH₄NO₃

C = C ₂ H ₆ O, Ethyl alcohol (46)
C = C ₄ H ₁₀ O, Ethyl ether (106)

B = NH₄Cl

C = C ₃ H ₆ O, Acetone, Fig. 9 (11, 61)
C = C ₃ H ₈ O, <i>n</i> -Propyl alcohol (108)

B = (NH₄)₂SO₄

C = C ₂ H ₆ O, Ethyl alcohol, Table 3 (17, 74, 110)
C = C ₃ H ₆ O, Acetone, Fig. 10 (61, 74)
C = C ₃ H ₈ O, <i>n</i> -Propyl alcohol (74)
C = C ₁₁ H ₁₂ N ₂ O, Antipyrine (26)

B = K₂CO₃

C = KC ₁₁ H ₁₉ O ₄ , Potassium ethyl dipropylmalonate, Fig. 7 (75)

C-TABLE

The B-components are in the C-arrangement. The C-components are of three types as follows: (a) carbon compounds in the C-arrangement; followed by (b) organic natural or commercial oils, etc., in alphabetical arrangement; followed by (c) the inorganic compounds, in standard arrangement (*v. p. viii*).

H₂O

B = CCl₄

C = CH ₄ O, Methyl alcohol, Fig. 11 (12)
C = C ₂ H ₆ O, Ethyl alcohol, Fig. 11 (12, 31); <i>v. also</i> p. 424
C = C ₃ H ₈ O, <i>n</i> -Propyl alcohol, Fig. 11 (12)

B = CS₂

C = CH ₄ O, Methyl alcohol (34)
C = C ₂ H ₄ O ₂ , Acetic acid (63)
C = C ₂ H ₆ O, Ethyl alcohol, Fig. 12 (57, 90, 111); <i>v. also</i> p. 424
C = C ₃ H ₈ O, <i>n</i> -Propyl alcohol (57)
C = C ₄ H ₁₀ O, Isobutyl alcohol (57)
B = CHCl ₃ , Chloroform
C = CH ₄ O, Methyl alcohol, Fig. 13 (5, 12)
C = C ₂ H ₄ O ₂ , Acetic acid, Fig. 14 (101, 126); <i>v. also</i> p. 424
C = C ₂ H ₆ O, Ethyl alcohol, Fig. 13 (5, 11, 12, 79, 90)

C = C ₃ H ₆ O, Acetone, Fig. 13 (5, 12); <i>v. also</i> p. 425
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C = C ₃ H ₆ O ₂ , Propionic acid, Fig. 14 (101)
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C = C ₃ H ₈ O, <i>n</i> -Propyl alcohol, Fig. 13 (12)

B = CH₂O₂, Formic acid

C = C ₄ H ₁₀ O, Ethyl ether, Fig. 14 (101); <i>v. also</i> p. 422

C = C ₆ H ₆ , Benzene, Fig. 14 (44); <i>v. also</i> p. 422
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B = CH₃I, Methyl iodide

C = CH ₄ O, Methyl alcohol (57)
C = C ₂ H ₆ O, Ethyl alcohol (57)
C = C ₃ H ₈ O, Propyl alcohol (57)
C = C ₄ H ₁₀ O, Isobutyl alcohol (57)

B = CH ₃ NO ₂ , Nitromethane
C = CdI ₂ (108)

B = CH ₄ O, Methyl alcohol
C = C ₂ H ₅ Br, Ethyl bromide, Fig. 16 (12)

C = C ₄ H ₈ O ₂ , Ethyl acetate, Fig. 15 (6)

C = C ₄ H ₁₀ O, Ethyl ether, Fig. 15 (6)
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C = C ₅ H ₁₂ O, <i>n</i> -Amyl alcohol (57)

C = C ₅ H ₁₂ O, Isoamyl alcohol, Fig. 17 (47)

C = C ₆ H ₅ Br, Bromobenzene, Fig. 16 (12)
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C = C ₆ H ₆ , Benzene, Fig. 15 (5, 7.5, 57)

C = C ₆ H ₇ N, Aniline (57)

C = C ₆ H ₁₄ , Hexane, Fig. 18 (12)

C = C ₇ H ₁₆ , Heptane, Fig. 18 (12)
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C = Gasolene (28)

C = Paraffin (28)

C = K ₂ CO ₃ , Table 4 (17, 51, 74)

B = C ₂ H ₄ Cl ₂ , Ethylene chloride

C = C ₂ H ₆ O, Ethyl alcohol, Fig. 19 (12)
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B = C ₂ H ₄ Cl ₂ , 1, 1-Dichloroethane

C = C ₂ H ₆ O, Ethyl alcohol, Fig. 19 (12)
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B = C₂H₄O₂, Acetic acid

C = C ₃ H ₅ ClO, α -Epichlorohydrin, Fig. 20 (71)
--

C = C ₄ H ₁₀ O, Ethyl ether, Fig. 14 (101); <i>v. also</i> p. 424

C = C ₆ H ₄ ClNO ₂ , Chloronitrobenzene (63)

C = C ₆ H ₅ Br, Bromobenzene (84)

C = C ₆ H ₅ NO ₂ , Nitrobenzene (63)

C = C ₆ H ₆ , Benzene, Table 5, Fig. 14 (63, 72, 84, 101, 114); <i>v. also</i> p. 424

C = C ₆ H ₇ N, Aniline, Figs. 37, 38 (1.5)
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C = C ₆ H ₁₂ , Cyclohexane (63)

C = C ₇ H ₇ Br, Bromotoluene (84)

C = C ₇ H ₇ NO ₂ , Nitrotoluene (63)

C = C ₇ H ₈ , Toluene, Fig. 37 (84, 117)
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C = C ₈ H ₁₀ , <i>m</i> -Xylene (84)
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C = C ₉ H ₁₁ Br, Bromomesitylene (63)

C = Petroleum (63)

B = C ₂ H ₅ Br, Ethyl bromide
C = C ₂ H ₆ O, Ethyl alcohol, Fig. 16 (12)

C = C ₃ H ₈ O, Propyl alcohol, Fig. 21 (12)

B = C₂H₅O, Ethyl alcohol

C = C ₃ H ₇ Br, Propyl bromide, Fig. 19 (12)
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C = C ₄ H ₄ N ₂ , Succinonitrile, Fig. 22 (92)

C = C ₄ H ₅ Cl ₃ O ₂ , Ethyl trichloroacetate, Fig. 12 (88)

C = C ₄ H ₆ Cl ₂ O ₂ , Ethyl dichloroacetate, Fig. 12 (88)
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C = C ₄ H ₇ ClO ₂ , Ethyl chloroacetate, Fig. 12 (88)
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- $C = C_4H_8O$, Methyl ethyl ketone, Fig. 6 (19)
 $C = C_4H_8O_2$, Ethyl acetate, Fig. 24 (6, 12, 79, 88, 100)
 $C = C_4H_8O_2$, Methyl propionate, Fig. 25 (88)
 $C = C_4H_8O_2$, Propyl formate, Fig. 26 (88)
 $C = C_4H_9Br$, Isobutyl bromide, Fig. 19 (12)
 $C = C_4H_{10}O$, *n*-Butyl alcohol, Fig. 21 (11, 33.5)
 $C = C_4H_{10}O$, Isobutyl alcohol, Fig. 21 (12, 17.5)
 $C = C_4H_{10}O$, Ethyl ether, Table 6 (6, 12, 16, 22, 32, 59, 68, 79)
 $C = C_5H_{10}O$, Diethyl ketone, Fig. 27 (12)
 $C = C_5H_{10}O_2$, Ethyl propionate, Fig. 25 (12, 88)
 $C = C_5H_{10}O_2$, *n*-Butyl formate, Fig. 26 (88)
 $C = C_5H_{10}O_2$, Methyl butyrate, Fig. 28 (88)
 $C = C_5H_{10}O_2$, Propyl acetate, Fig. 24 (88)
 $C = C_6H_{11}Br$, Isoamyl bromide, Fig. 19 (12)
 $C = C_6H_{12}O$, Amyl alcohol (57)
 $C = C_6H_{12}O$, Isoamyl alcohol, Table 7 (12, 38, 47, 88)
 $C = C_6H_6Br$, Bromobenzene, Fig. 16 (12)
 $C = C_6H_5NO_2$, Nitrobenzene, Fig. 21 (12, 35, 39)
 $C = C_6H_6$, Benzene, Table 5 (5, 7.1, 11, 12, 57, 72, 81, 103, 105); *v. also* p. 424
 $C = C_6H_6O$, Phenol, Fig. 35 (93)
 $C = C_6H_7N$, Aniline (35, 39, 57)
 $C = C_6H_{12}O_2$, Butyl acetate, Fig. 24 (88)
 $C = C_6H_{12}O_2$, Ethyl butyrate, Fig. 28 (7, 12, 88)
 $C = C_6H_{12}O_2$, Isoamyl formate, Fig. 26 (88)
 $C = C_6H_{12}O_2$, Methyl isovalerate, Fig. 26 (88)
 $C = C_6H_{12}O_2$, Propyl propionate, Fig. 25 (88)
 $C = C_6H_{14}$, Hexane, Fig. 18 (12)
 $C = C_6H_{15}N$, Triethylamine, Fig. 27 (76)
 $C = C_7H_6O$, Benzaldehyde, Fig. 27 (12)
 $C = C_7H_7Br$, Bromotoluene, Fig. 16 (12)
 $C = C_7H_7NO_2$, *p*-Nitrotoluene, Fig. 21 (12)
 $C = C_7H_8$, Toluene, Fig. 18 (12, 30)
 $C = C_7H_8O$, Benzyl alcohol, Fig. 21 (12)
 $C = C_7H_9N$, Methylaniline, Fig. 27 (12)
 $C = C_7H_9N$, *o*-Toluidine, Fig. 21 (12)
 $C = C_7H_{14}O_2$, Ethyl isovalerate, Fig. 26 (7, 88)
 $C = C_7H_{14}O_2$, Isoamyl acetate, Fig. 24 (7, 88)
 $C = C_7H_{14}O_2$, Propyl butyrate, Fig. 28 (88)
 $C = C_7H_{16}$, Heptane, Fig. 18 (12)
 $C = C_8H_8O_3$, Methyl salicylate, Fig. 24 (100)
 $C = C_8H_{10}$, *o*-, *m*- or *p*-Xylene, Fig. 27 (12, 58)
 $C = C_8H_{10}O$, Phenetole, Fig. 21 (12)
 $C = C_9H_{10}O_2$, Benzyl acetate, Fig. 24 (12)
 $C = C_9H_{12}$, Mesitylene, Fig. 27 (12)
 $C = C_9H_{12}O$, Benzyl ethyl ether, Fig. 18 (12)
 $C = C_{10}H_7Br$, α -Bromonaphthalene, Table 8 (65)
 $C = C_{10}H_{12}O$, Anethole (56.5)
 $C = C_{10}H_{12}O$, Methylchavicol (56.5)
 $C = C_{10}H_{12}O_2$, Eugenol (56.5)
 $C = C_{10}H_{16}$, Pinene, Fig. 27 (12)
 $C = C_{10}H_{18}O$, Cineole (23)
 $C = C_{10}H_{22}O$, Isoamyl ether, Fig. 18 (12)
 $C = C_{13}H_{10}O$, Benzophenone, Fig. 29 (8)
 $C = C_{16}H_{32}O_2$, Palmitic acid (24)
 $C = C_{18}H_{34}O_2$, Oleic acid, Fig. 12 (24, 100)
 $C =$ Anise oil (56.5)
 $C =$ Arachis oil (23)
 $C =$ Axunge oil (23)
 $C =$ Beef marrow (23)
 $C =$ Beeswax (23)
 $C =$ Bergamot extract (24)
 $C =$ Butterfat (2, 23, 25, 112)
 $C =$ Cajaput oil (56.5)
 $C =$ Carnauba wax (24)
 $C =$ Castor oil (23)
 $C =$ Ceresine (23)
 $C =$ Cherrylaurel oil (56.5)
 $C =$ Cinnamon oil (56.5)
 $C =$ Citron extract (24)
 $C =$ Citron oil (56.5)
 $C =$ Clove extract (24)
 $C =$ Clove oil (56.5)
 $C =$ Cocoa butter (23)
 $C =$ Coconut oil (23)
 $C =$ Cod-liver oil (23)
 $C =$ Colza oil (23)
 $C =$ Cottonseed oil (23)
 $C =$ Eucalyptus oil (23)
 $C =$ Fennel oil (56.5)
 $C =$ Gasolene (23)
 $C =$ Hempseed oil (23)
 $C =$ Juniper extract (24)
 $C =$ Lavender oil (56.5)
 $C =$ Lemon extract (24)
 $C =$ Linseed oil (24)
 $C =$ Mace oil (56.5)
 $C =$ Margarin (2, 23, 25)
 $C =$ Mozambique wax (24)
 $C =$ Mustard oil (56.5)
 $C =$ Mutton tallow (23)
 $C =$ Oleomargarin (2, 23)
 $C =$ Olive oil (23)
 $C =$ Orange oil (56.5)
 $C =$ Palm butter (23)
 $C =$ Paraffin (23, 28)
 $C =$ Peppermint extract (24)
 $C =$ Peppermint oil (56.5)
 $C =$ Petroleum ether (27, 28, 112)
 $C =$ *Pinus pumilio* extract (24)
 $C =$ *Pinus sylvestris* extract (24)
 $C =$ Poppy oil (23)
 $C =$ Rosemary oil (56.5)
 $C =$ Sandalwood extract (24)
 $C =$ Sandalwood oil (56.5)
 $C =$ Sesame oil (23)
 $C =$ Sperm oil (23)
 $C =$ Sweet almond oil (23)
 $C =$ Turpentine (23, 56.5, 113)
 $C =$ Walnut oil (23)
 $C =$ "Wyte spirite" (24)
 $C =$ $MnSO_4$, Table 3 (29, 74, 97)
 $C =$ Na_2SO_4 , Table 3 (17)
 $C =$ Na_2CO_3 , Table 3 (21, 66, 74)
 $C =$ KF, Table 3 (51)
 $C =$ K_2CO_3 , Table 3 (8, 17, 29, 51, 74)
 $B = C_2H_5N_2O_4$, Ammonium oxalate
 $C = C_4H_{10}O$, Ethyl ether (106)
 $B = C_3H_4O$, Acrolein
 $C = C_6H_6O_2$, Hydroquinol (14)
 $C = C_7H_6O_5$, Gallic acid (14)
 $B = C_3H_4O_4$, Malonic acid
 $C = C_4H_{10}O$, Ethyl ether, Fig. 17 (67)
 $B = C_3H_6O$, Allyl alcohol
 $C =$ NaCl, Table 9 (52)
 $C =$ Na_2CO_3 , Table 9 (52)
 $C =$ KF, Table 9 (52)
 $C =$ K_2CO_3 , Table 9 (52)
 $B = C_3H_6O$, Acetone
 $C = C_4H_8O_2$, Ethyl acetate, Fig. 30 (6)
 $C = C_5H_{12}O$, Amyl alcohol, Fig. 30 (61)
 $C = C_6H_5Br$, Bromobenzene, Fig. 16 (12)
 $C = C_6H_6$, Benzene, Fig. 30 (5, 11, 61); *v. also* p. 425
 $C = C_6H_6O$, Phenol, Fig. 31 (95.5, 96)
 $C = C_6H_7N$, Aniline, Fig. 30 (61)
 $C = C_6H_{12}O_6$, Dextrose, Table 10 (69)
 $C = C_7H_8$, Toluene, Table 11 (61, 115)
 $C = C_{10}H_8$, Naphthalene, Fig. 29 (8, 20)
 $C = C_{10}H_{12}O$, *p*-Anethole, Fig. 29 (8)
 $C = C_{12}H_{22}O_{11}(H_2O)$, Maltose, Table 10 (69)
 $C = C_{12}H_{22}O_{11}$, Sucrose, Table 10 (8, 69)
 $C = C_{13}H_{10}O$, Benzophenone, Fig. 29 (8)
 $C =$ $MnSO_4$ (74)
 $C =$ $CaCl_2$, Fig. 10 (49, 61)
 $C =$ Li_2SO_4 , Fig. 9 (61)
 $C =$ NaCl, Fig. 10 (49, 61)
 $C =$ Na_2SO_4 , Fig. 10 (61)
 $C =$ $NaNO_3$, Fig. 10 (61)
 $C =$ Na_2CO_3 , Table 12 (8)
 $C =$ KF, Table 12 (49)
 $C =$ KCl, Fig. 9 (104)
 $C =$ K_2CO_3 , Table 12 (8, 49, 74)
 $B = C_3H_5O_2$, Propionic acid
 $C = C_4H_{10}O$, Ethyl ether, Fig. 14 (101)
 $C = C_6H_6$, Benzene, Fig. 14 (101); *v. also* p. 425
 $B = C_3H_5O$, *n*-Propyl alcohol
 $C = C_4H_{10}O$, *n*-Butyl alcohol, Fig. 21 (11)
 $C = C_5H_{12}O$, Amyl alcohol (57)
 $C = C_6H_5Br$, Bromobenzene, Fig. 16 (12)
 $C = C_6H_6$, Benzene (57)
 $C = C_6H_7N$, Aniline (57)
 $C = C_7H_7Br$, Bromotoluene, Fig. 18 (12)
 $C =$ Paraffin (28)
 $C =$ $AgNO_3$ (108)
 $C =$ $MnSO_4$ (74)
 $C =$ $CaCl_2$ (108)
 $C =$ $BaCl_2$ (108)
 $C =$ LiCl (108)
 $C =$ NaCl, Table 13 (51, 108)
 $C =$ Na_2SO_4 (74, 108)
 $C =$ Na_2CO_3 , Table 13 (52, 74)
 $C =$ KF, Table 13 (51)
 $C =$ KCl (108)
 $C =$ KBr (108)
 $C =$ KNO_3 (108)
 $C =$ K_2CO_3 , Table 13 (51, 74, 108)
 $B = C_3H_8O$, Isopropyl alcohol
 $C = C_4H_{10}O$, *n*-Butyl alcohol, Fig. 21 (11)
 $C =$ KF, Table 14 (52)
 $C =$ K_2CO_3 , Table 14 (52)
 $B = C_4H_4N_2$, Succinonitrile
 $C = C_4H_{10}O$, Ethyl ether (127); Vol. IV, *v. p.* 413
 $C = C_6H_{14}O_6$, Mannitol (108)
 $C = C_7H_6O_2$, Benzoic acid (128); *v. Vol. IV, p.* 413

- $B = C_4H_4N_2$,—(Continued)
 $C = C_{10}H_8$, Naphthalene (108)
 $C = C_{10}H_{16}O$, Camphor (108)
 $C = C_{12}H_{10}N_2$, Azobenzene (108)
 $C = C_{12}H_{22}O_{11}$, Sucrose (108)
 $C = C_{14}H_{10}O_2$, Benzil (108)
 $C = AgNO_3$, Fig. 32 (78)
 $C = NaCl$, Fig. 32 (91)
 $B = C_4H_6O_4$, Succinic acid
 $C = C_4H_{10}O$, Ethyl ether, Table 15 (48)
 $C = C_6H_6O$, Phenol (108)
 $B = C_4H_6O_6$, Tartaric acid
 $C = C_6H_6O$, Phenol, Figs. 7 and 8 (95)
 $B = C_4H_8O$, Methyl ethyl ketone
 $C = NaCl$, Table 16 (50)
 $C = KF$, Table 16 (50)
 $B = C_4H_8O_2$, Butyric acid
 $C = C_6H_{14}O_6$, Mannitol (108)
 $C = C_{10}H_8$, Naphthalene (108)
 $C = C_{12}H_{10}N_2$, Azobenzene (108)
 $C = C_{12}H_{22}O_{11}$, Sucrose (108)
 $C = C_{13}H_{10}O$, Benzophenone (108)
 $C = Ba(NO_3)_2$, (108)
 $C = NaCl$ (108)
 $C = K_2SO_4$ (108)
 $B = C_4H_8O_2$, Ethyl acetate
 $C = C_6H_8N_2O_3$, Aniline nitrate (42)
 $C = ZnSO_4$ (40)
 $C = MgSO_4$ (40)
 $C = NaCl$ (40, 73)
 $C = Na_2S_2O_3$ (40)
 $C = NaNO_3$ (73)
 $C = KCl$ (40)
 $C = KNO_3$ (40)
 $B = C_4H_{10}O$, *n*-Butyl alcohol
 $C = C_6H_6$, Benzene, Fig. 15 (11)
 $B = C_4H_{10}O$, Isobutyl alcohol
 $C = C_5H_{12}O$, Isoamyl alcohol, Fig. 37 (18)
 $C = C_6H_6$, Benzene (57)
 $B = C_4H_{10}O$, *sec*-Butyl alcohol
 $C = C_6H_6O_2$, Hydroquinol (108)
 $B = C_4H_{10}O$, *tert*-Butyl alcohol
 $C = KCl$ (108)
 $B = C_4H_{10}O$, Ethyl ether
 $C = C_6H_{14}O_6$, Mannitol (41)
 $C = C_6H_{15}N$, Triethylamine, Fig. 34 (76)
 $C = Hg(CN)_2$ (106)
 $C = FeCl_3$ (106)
 $C = FeSO_4$ (106)
 $C = Al_2(SO_4)_3$ (106)
 $C = LiCl$ (41)
 $C = NaOH$ (41)
 $C = NaF$ (106)
 $C = NaCl$, Table 15 (9, 41, 73, 106, 107)
 $C = NaBr$ (106)
- $C = NaI$ (106)
 $C = Na_2SO_4$ (41, 106)
 $C = Na_3PO_4$ (106)
 $C = Na_3AsO_4$ (106)
 $C = Na_2CO_3$ (41)
 $C = NaC_2H_3O_2$, Acetate, Table 15 (42, 73, 106)
 $C = NaC_3H_5O_3$, Lactate (73)
 $C = NaC_6H_5O$, Phenolate (73)
 $C = NaC_7H_5O_2$, Benzoate (106)
 $C = NaC_7H_5O_3$, Salicylate (106)
 $C = NaC_9H_7O_2$, Cinnamate (106)
 $C = Na_2C_4H_2O_4$, Maleate (73)
 $C = Na_2C_4H_4O_4$, Succinate (106)
 $C = Na_2C_4H_4O_6$, Tartrate (106)
 $C = Na_2C_8H_4O_4$, Phthalate (106)
 $C = Na_3C_6H_5O_7$, Citrate (106)
 $C = NaC_6H_5O_3S$, Benzene-sulfonate (106)
 $C = NaC_6H_2N_3O_7$, Picrate (73)
 $C = Na_2CrO_4$ (106)
 $C = Na_2Cr_2O_7$ (106)
 $C = Na_2MoO_4$ (106)
 $C = Na_2WO_4$ (106)
 $C = KCl$ (41)
 $C = KI$ (41)
 $C = KNO_3$ (41)
 $B = C_5H_5N$, Pyridine
 $C = C_6H_6$, Benzene, Fig. 37 (117.5)
 $C = MgSO_4$ (108)
 $C = CaCl_2$ (108)
 $C = LiCl$ (108)
 $C = KCl$ (108)
 $C = KBr$ (108)
 $C = K_2CO_3$ (26, 108)
 $B = C_5H_{12}O$, Isoamyl alcohol
 $C = NaCl$, Table 17 (47)
 $B = C_6H_5NO_2$, Nitrobenzene
 $C = C_6H_6O$, Phenol (15)
 $C = C_6H_8N_2O_3$, Aniline nitrate (42)
 $C = C_6H_8N_2O_3$, Picoline nitrate (42)
 $C = C_7H_9NO_2$, Ammonium benzoate (42)
 $C = NaC_4H_7O_2$, Butyrate (42)
 $C = NaC_5H_9O_2$, Isovalerate (42)
 $C = NaC_6H_2N_3O_7$, Picrate (42)
 $C = Na_2C_8H_4O_4$, Phthalate (42)
 $C = KC_5H_9O_2$, Isovalerate (42)
 $B = C_6H_5NO_3$, *o*- or *p*-Nitrophenol
 $C = C_6H_6O$, Phenol (56)
 $B = C_6H_6$, Benzene
 $C = C_6H_6O$, Phenol, Fig. 15 (60); *v. also* p. 428
 $C = AgClO_4$, Fig. 7 (129)
 $B = C_6H_6O$, Phenol
 $C = C_6H_6O_2$, *o*-Dihydroxybenzene (Pyrocatechol) Fig. 33 (70)
- $C = C_6H_6O_2$, Hydroquinol, Fig. 33 (70)
 $C = C_6H_6O_2$, Resorcinol, Fig. 33 (70)
 $C = C_6H_6O_3$, Pyrogallol, Fig. 33 (4)
 $C = C_6H_7N$, Aniline, Fig. 23 (1, 93)
 $C = C_6H_{15}N$, Triethylamine, Fig. 34 (76)
 $C = C_7H_6O_2$, Benzoic acid (108)
 $C = C_7H_6O_3$, Salicylic acid (108)
 $C = C_{10}H_8$, Naphthalene, Fig. 7 (15, 108)
 $C = C_{10}H_9N$, Naphthylamine (15)
 $C = C_{10}H_{16}O$, Camphor (108)
 $C = C_{12}H_{10}N_2$, Azobenzene (108)
 $C = C_{13}H_{10}O$, Benzophenone (108)
 $C = C_{13}H_{10}O_3$, Salol (15)
 $C = C_{14}H_8O_2$, Anthraquinone (15, 108)
 $C = C_{14}H_{10}O_2$, Benzil (108)
 $C = C_{18}H_{18}O_{12}$, Hexamethyl mellitate (108)
 $C = Hg(CN)_2$ (108)
 $C = MgCl_2$ (98)
 $C = MgSO_4$ (108)
 $C = Ca(OH)_2$, Fig. 35 (36, 37, 77)
 $C = CaCl_2$ (98)
 $C = Sr(OH)_2$ (77)
 $C = SrCl_2$ (98)
 $C = Ba(OH)_2$, Fig. 35 (36, 37, 77)
 $C = BaCl_2$ (98)
 $C = Ba(NO_3)_2$ (108)
 $C = LiOH$ (77)
 $C = LiCl$ (98)
 $C = NaOH$, Fig. 8 (36, 37, 77)
 $C = NaF$ (98)
 $C = NaCl$, Figs. 7 and 35 (36, 37, 94, 98, 108)
 $C = NaBr$ (98)
 $C = Na_2SO_4$, Fig. 8 (36)
 $C = NaNO_3$ (98)
 $C = NaCHO_2$, Formate (98)
 $C = NaC_2H_3O_2$, Acetate (98)
 $C = NaC_3H_5O_3$, Lactate (98)
 $C = NaC_7H_5O_2$, Benzoate (98)
 $C = NaC_7H_5O_3$, Salicylate (98)
 $C = NaC_{18}H_{33}O_2$, Oleate, Fig. 33 (4, 108)
 $C = Na_2C_4H_4O_4$, Succinate (98)
 $C = Na_2C_4H_4O_5$, Malate (98)
 $C = Na_2C_4H_4O_6$, Tartrate (98)
 $C = Na_3C_6H_5O_7$, Citrate (98)
 $C = NaC_2H_2ClO_2$, Chloroacetate (98)
 $C = NaC_2HCl_2O_2$, Dichloroacetate (98)
- $C = NaCCl_3O_2$, Trichloroacetate (98)
 $C = NaCNS$ (98)
 $C = KOH$ (77)
 $C = KCl$ (98, 108)
 $C = KBr$ (108)
 $C = K_2SO_4$ (108)
 $C = KNO_2$ (108)
 $B = C_6H_7N$, Aniline
 $C = C_6H_8ClN$, Aniline hydrochloride, Fig. 36; Table 18 (41, 102)
 $C = C_6H_8N_2O_3$, Aniline nitrate, Table 18 (41)
 $C = C_6H_{14}$, Hexane (34)
 $C = C_7H_9NO_2$, Ammonium benzoate (42)
 $C = AgClO_4$ (55)
 $C = CaCl_2$ (41)
 $C = LiCl$ (41)
 $C = NaOH$ (41)
 $C = NaCl$ (41)
 $C = NaC_2H_3O_2$, Acetate (42)
 $C = NaC_4H_7O_2$, Butyrate (42)
 $C = NaC_5H_9O_2$, Isovalerate (42)
 $C = NaC_7H_5O_2$, Benzoate (42)
 $C = NaC_7H_5O_3$, Salicylate (42)
 $C = KCl$ (41)
 $C = KC_5H_9O_2$, Isovalerate (42)
 $B = C_6H_{10}O_3$, Ethyl acetoacetate
 $C = NaCl$, Table 19 (73)
 $C = NaNO_3$, Table 19 (73)
 $B = C_6H_{12}O_6$, Dextrose (108)
 $C = C_6H_{15}N$, Triethylamine
 $B = C_6H_{14}O_6$, Mannitol (108)
 $C = C_6H_{15}N$, Triethylamine
 $B = C_6H_{15}N$, Triethylamine
 $C = C_{10}H_8$, Naphthalene (108)
 $C = C_{10}H_{16}O$, Camphor (108)
 $C = C_{12}H_{10}N_2$, Azobenzene (108)
 $C = C_{12}H_{22}O_{11}$, Sucrose (108)
 $C = C_{14}H_{10}O_2$, Benzil (108)
 $C = BaCl_2$ (108)
 $C = KCl$ (108)
 $C = K_2SO_4$ (108)
 $C = K_2CO_3$ (108)
 $C = KCNS$ (108)
 $B = C_7H_5BrO_2$, *p*-Bromobenzoic acid
 $C = C_{10}H_8$, Naphthalene (45)
 $B = C_7H_5ClO_2$, *p*-Chlorobenzoic acid
 $C = C_{10}H_8$, Naphthalene (45)
 $B = C_7H_5IO_2$, *p*-Iodobenzoic acid
 $C = C_{10}H_8$, Naphthalene (45)
 $B = C_7H_5NO_4$, *p*-Nitrobenzoic acid
 $C = C_{13}H_{10}O$, Benzophenone (45)
 $B = C_7H_7NO_2$, *m*-Aminobenzoic acid
 $C = C_{10}H_{16}O$, Camphor (45)

C = C ₁₃ H ₁₀ O, Benzophenone (45)	C = LiCl (106)
B = C ₇ H ₇ NO ₂ , <i>p</i> -Aminobenzoic acid	C = NaBr (106)
C = C ₁₀ H ₈ , Naphthalene (45)	C = NaI (106)
C = C ₁₀ H ₁₆ O, Camphor (45)	B = C ₇ H ₈ O, <i>o</i> -, <i>m</i> -, or <i>p</i> -Cresol
C = C ₁₃ H ₁₀ O, Benzophenone (45)	C = NaC ₁₈ H ₃₃ O ₂ , Oleate, Fig. 33 (4)
C = C ₁₄ H ₁₀ O ₂ , Benzil (45)	B = C ₁₀ H ₁₄ N ₂ , Nicotine
B = C ₇ H ₈ , Toluene	C = NaOH, Fig. 6 (36, 37)
C = AgClO ₄ (130)	C = Na ₂ SO ₄ , Fig. 6 (36, 37)
B = C ₇ H ₈ N ₂ O, Phenylurea	B = C ₁₁ H ₁₂ N ₂ O, Antipyrine
C = CaCl ₂ (106)	C = Na ₂ S ₂ O ₃ (26)
	C = K ₂ CO ₃ (26)

NON-AQUEOUS SYSTEMS

SO ₂ (80)	B = C ₆ H ₁₂ , Butylethylene
B = C ₅ H ₁₀ , Amylene	C = C ₆ H ₁₄ , Hexane
C = C ₅ H ₁₂ , Pentane	B = C ₇ H ₈ , Toluene
B = C ₆ H ₁₂ , Pentane	C = C ₈ H ₁₈ , Octane
C = C ₆ H ₆ , Benzene	C = Kerosene
C = C ₆ H ₁₂ , Butylethylene	B = C ₈ H ₁₀ , Xylene
B = C ₆ H ₆ , Benzene	C = Naphthene
C = C ₆ H ₁₂ , Cyclohexane	B = C ₈ H ₁₆ , Octylene
C = C ₆ H ₁₂ , Butylethylene	C = Naphthene
C = C ₆ H ₁₄ , Hexane	B = Gasolene
B = C ₆ H ₁₂ , Cyclohexane	C = Naphthene
C = C ₉ H ₂₀ , Nonane	

C-TABLE

The C-arrangement (*v. p.* viii)

Natural and commercial oils, etc., are placed last in alphabetical order.

CS ₂ (34)	B = C ₆ H ₁₂ O, Cyclohexanol
B = CH ₄ N ₂ O, Urea	C = Gasolene (89)
C = CH ₄ O, Methyl alcohol	B = C ₁₀ H ₁₈ O, Terpineol
B = CH ₄ O, Methyl alcohol	C = Gasolene (89)
C = C ₄ H ₆ O ₄ , Succinic acid	B = C ₁₁ H ₁₆ O, Butylresol
C = C ₁₂ H ₁₁ N, Diphenylamine	C = Gasolene (89)
C = HgCl ₂	B = Butter fat
C = BaCl ₂	C = Coconut oil (43)
C = NaI	B = Castor oil
C = KCl	C = Gasolene (89)
C = KBr	
C ₂ H ₆ O	C ₃ H ₇ NO ₂
Ethyl alcohol	Urethane
B = C ₃ H ₆ O ₃ , Methyl carbonate	B = C ₆ H ₇ N, Aniline
C = Gasolene (89)	C = C ₆ H ₁₄ , Hexane (34)
B = C ₃ H ₈ O, Isopropyl alcohol	C ₆ H ₄ N ₂ O ₄
C = Gasolene (89)	<i>m</i> -Dinitrobenzene
B = C ₃ H ₈ O ₃ , Glycerol	B = C ₆ H ₅ NO ₂ , Nitrobenzene
C = Ethereal oils (13)	C = C ₆ H ₁₄ , Hexane (108)
B = C ₄ H ₁₀ O, <i>n</i> -Butyl alcohol	C ₆ H ₅ NO ₂
C = Gasolene (89)	Nitrobenzene (108)
B = C ₄ H ₁₀ O, Isobutyl alcohol	B = C ₆ H ₅ NO ₃ , <i>p</i> -Nitrophenol
C = Gasolene (89)	C = C ₆ H ₁₄ , Hexane
B = C ₄ H ₁₀ O, Ethyl ether	B = C ₆ H ₆ O ₂ , Hydroquinol
C = Gasolene (89)	C = C ₆ H ₁₄ , Hexane
B = C ₆ H ₁₂ O, Amyl alcohol	B = C ₆ H ₆ O ₂ , Resorcinol
C = Gasolene (89)	C = C ₆ H ₁₄ , Hexane
B = C ₆ H ₆ , Benzene	B = C ₆ H ₆ O ₃ , Pyrogallol
C = Gasolene (89)	C = C ₆ H ₁₄ , Hexane

B = C ₆ H ₁₄ , Hexane	C ₆ H ₇ N
C = C ₇ H ₅ NO ₃ , <i>p</i> -Nitrobenzaldehyde	Aniline
C = C ₇ H ₅ NO ₄ , <i>m</i> -Nitrobenzoic acid	B = C ₆ H ₁₄ , Hexane
C ₆ H ₆	C = C ₇ H ₇ NO, Benzamide (34)
Benzene (109)	C = C ₁₃ H ₁₂ N ₂ S, 1, 2-Diphenylthiourea (34)
B = C ₆ H ₇ N, Aniline	C = C ₁₄ H ₁₀ O ₂ , Benzil (34)
C = C ₆ H ₁₂ , Cyclohexane	B = C ₇ H ₈ , Toluene
C = C ₇ H ₁₆ , Heptane	C = Gasolene (109)
C = Gasolene	B = C ₈ H ₁₀ , Xylene
	C = Gasolene (109)

SPECIAL TABLES

TABLE 1.—H₂O; Br₂; ELECTROLYTESMoles per l; HgBr₂, *t* = 25°C

HgBr ₂	0.00	0.05	0.10	0.15	0.20	
Br ₂	0.216	0.220	0.222	0.223	0.223	±0.0005

With other salts, the solubility of bromine is best expressed as the ratio of the excess bromine dissolved (concentration of bromine in the salt solution minus that in pure water at same temperature) to salt concentration. This ratio has the values tabulated under the corresponding salt formulae.

M _{salt} /l	Ratio, KBr		Ratio, SrBr ₂
	<i>t</i> = 0°C	<i>t</i> = 25°C	<i>t</i> = 25°C
0.001	0.7 ± 0.1		
0.01	1.0 ± 0.04		1.4 ± 0.2
0.02	1.06 ± 0.02		1.6 ± 0.1
0.05	1.14 ± 0.02	1.0 ± 0.05	1.9 ± 0.1
0.1	1.17 ± 0.02	1.04 ± 0.05	2.2 ± 0.1
0.2	1.20 ± 0.05	1.08 ± 0.05	2.5 ± 0.1
0.5	1.25 ± 0.05	1.15 ± 0.05	3.0 ± 0.2
1	1.30 ± 0.05	1.20 ± 0.05	
2	1.45 ± 0.1	1.30 ± 0.1	

M _{salt} /l	Ratio, <i>t</i> = 20.8°C		
	HBr	HCl	NaCl
0.05	1.10 ± 0.02		
0.1	1.12 ± 0.02		
0.2	1.13 ± 0.02		
0.5	1.14 ± 0.02		
1	1.17 ± 0.02	0.26 ± 0.005	0.15 ± 0.01
2	1.21 ± 0.03	0.28 ± 0.005	0.16 ± 0.01
3		0.30 ± 0.005	0.18 ± 0.01

Ratio	M _{salt} /l, <i>t</i> = 25°C	
	0.05	1.0
NaNO ₃	-0.033 ± 0.002	-0.033 ± 0.001
Na ₂ SO ₄	-0.056 ± 0.002	-0.056 ± 0.001
K ₂ SO ₄		

TABLE 2.—H₂O; HBr; SO₂

At -33.5°C, the number of moles of HBr which dissolve in SO₂ containing about 1 mole of water per 1000 g, is equal, within 1%, to the number of moles of water present.

TABLE 3.—H₂O(A); C₂H₆O(B), ETHYL ALCOHOL; SALTS (C)
C = (NH₄)₂SO₄

% B	% C, 15°	% C, 30°	% (C) _c ± 1, 33°	% C, 50°
15	25.3*	24.5*		23.9*
20	20.3*	20.0*		19.5*
25	16.0*	16.0*		15.7*
30	12.5*	12.8*		12.8*
40	6.7†	7.2†		7.4†
45			28	
50	3.1†	3.8†	31	4.2†
60		1.8†	36	
65			38	

TABLE 3.—(Continued)

% C	$t, ^\circ\text{C}$	% B ± 0.5		
		15	30	60
30		10.8	10.2	9.7
35		7.6	7.0	6.5
40			4.5	

* ± 0.5 .† ± 0.3 .C = MnSO_4 ; $t = 30^\circ\text{C}$

% B	% C	% (C) _C ± 0.5	% C	% B ± 0.3
30	9.3 ± 0.3	21.0	20	17.3
35	6.2 ± 0.3	24.5	25	12.3
40	4.0 ± 0.3	27.5	30	8.7
45	2.5 ± 0.3	30.0	35	6.3
50	1.7 ± 0.2	32.5		
55	1.0 ± 0.2	35.0		

Plait-point ± 1 : A = 62%; B = 23%; C = 15% at 30°C .Temperature coefficients: $dC/dT = ca.$ -0.06 for B = 35%; $dB/dT = -0.1$ for C = 20 or 35%.C = Na_2SO_4 ; $t = 35^\circ\text{C}$

% B	% C ± 0.5	% (C) _C ± 1	% C	% B ± 0.5
20	11.7	21	20	10.7
25	8.4	25	25	6.0
30	6.0		30	3.9
35	4.2			

Plait-point ± 1 : A = 69%; B = 15%; C = 16% at 35°C .Temperature coefficients: $dC/dT = 0.1$ for B = 25%; $dB/dT = 0.0$ for C = 25%; $d(C)_C/dT = ca.$ -0.2 for B = 25%.C = Na_2CO_3 ; $t = 30^\circ\text{C}$

% B	% C	% C	% B ± 0.3
10	17.0 ± 0.3	20	7.0
15	12.8 ± 0.3	25	3.4
20	9.4 ± 0.3	30	1.5
30	4.8 ± 0.3		
40	2.1 ± 0.2		
50	0.6 ± 0.2		
60	0.4 ± 0.1		

C₁ = KF; C₂ = K_2CO_3 ; $t = 25^\circ\text{C}$

% B	% C ₁ *	% (C ₁) _C ± 0.5	% C ₂	% (C ₂) _C ± 0.5
10	22.0		22.0*	6.0
15	18.7	6.0	18.0*	10.0
20	16.4	8.0	14.6*	14.0
30	12.7	11.0	9.0†	19.0
40	9.0	15.0	5.0†	23.5
50	6.2	18.5	2.5†	27.0
60	4.0	22.0	1.0†	31.0
70	2.2		0.45‡	36.0
80	1.4		0.13§	42.0
90	1.2	43.0	0.10§	

% Salt (25°C)	20	25	30	35	40	45
% B for C ₁ *	13.0	7.0	4.0	2.2	1.4	0.7
% B for C ₂	12.5*	7.2*	4.0*	2.2†	1.1†	0.7‡

Plait-points ± 1 at 25°C : A = 57%; B = 31%; C₁ = 12%; A = 65%; B = 20.5%; C₂ = 14.5%.Temperature coefficient of carbonates, negligible; but K_2CO_3 in conjugated layer is 1% less at 40 than at 25°C .* ± 0.2 . ‡ ± 0.05 .† ± 0.1 . § ± 0.03 .TABLE 4.— H_2O (A); CH_3O (B), METHYL ALCOHOL; K_2CO_3 (C)
 $t = 22^\circ\text{C}$

% B	% C	% (C) _C ± 0.5	dC/dT
10.0 ± 0.5	40		
6.5 ± 0.5	45		
5.0 ± 0.5	50		
15	34.5 ± 0.5		-0.06
20	31.0 ± 0.5		-0.05
30	23.5 ± 0.5	26.0	-0.05
40	17.5 ± 0.5	32.0	-0.04
50	12.0 ± 0.5		-0.04
60	8.0 ± 0.5		-0.04
70	5.5 ± 1	49.0	-0.04

Plait-point ± 0.5 : A = 46.7%; B = 28.5%; C = 24.8%.TABLE 5.— H_2O (A); $\text{C}_2\text{H}_5\text{O}$ (B), ETHYL ALCOHOL; C_6H_6 (C),
BENZENE

% C	% B ± 0.5 , 0°C	% B ± 0.2 , 25°C	% (A) _C ± 0.5 , 25°C	% B ± 0.5 , 60°C	% (A) _C ± 1 , 65°C
20	56.5	52.3	3.2	46.0	8
30	53.5	49.5	5.0	44.2	14
40	48.3	44.8	6.5	40.5	19
50	41.5	39.0	9.0	36.0	25
60	33.9	32.5	13.5	30.5	31
70	26.0	25.4	21.0	24.2	40
80		17.7	34.0	17.0	54
90		9.2	53.0		
95		4.8	65.5 ± 1		
98			78.0 ± 1		
% A					
30	56.7	52.5		45.5	
35	55.5	52.2		46.0	
40	53.4	50.8		45.2	
50	47.0	45.6		42.0	
60		38.7		36.0	
70		29.6			
80		19.9			

Intermediate temperatures can be found by linear interpolation.

Plait-points ± 0.5 at 25°C : A = 9.8%; B = 37.2%; C = 53.0%; ± 1 at 65°C : A = 19.5%; B = 39.5%; C = 41.0%. H_2O (A); $\text{C}_2\text{H}_4\text{O}_2$ (B), Acetic acid; C_6H_6 (C), Benzene

% C	$t = 25^\circ\text{C}$		$t = 35^\circ\text{C}$	
	% (A) _C ± 0.5	% B ± 0.2	% (A) _C ± 1	% B ± 0.2
15	2.0	65.5	2	64.4*
20	3.0	64.1	3	63.1
30	5.7	59.0	7	58.3
40	8.5	52.5	10	51.8
50	12.0	45.0	15	44.4
60	15.2	36.9	19	36.4
70	20.5	28.3	25	
80	29.0		34	
90	46.0		50	
95	63.0		65	

% A	25	30	40	50	60
% B, 25°C	65.2†	62.8†	56.2†	48.2†	39.0†
% B, 35°C	64.0*	62.0*	55.6†	47.9†	38.8†

Plait-point ± 1 at 25°C : A = 8.0%; B = 53.5%; C = 38.5%.* ± 0.3 .† ± 0.2 .

TABLE 6.—H₂O(A); C₂H₆O(B), ETHYL ALCOHOL; C₄H₁₀O(C), ETHYL ETHER

% C	0°C		25°C	
	% (A) _C ± 0.5	% B ± 0.2	% (A) _C ± 0.5	% B ± 0.2
40	41.7	27.6	47.0	28.2
45	46.2	27.3	51.5	27.8
50	50.0	26.3	55.2	26.8
55	54.0	25.3	59.0	25.7
60	57.5	23.5	62.5	24.0
65	60.5	21.5	65.0	22.0
70	63.0	19.2	67.5	19.6
75	65.2	16.5	70.0	16.8
80	67.5	13.4	72.5	13.5
85	71.0	10.2	76.2	10.2
90	74.5	6.8	80.5	6.6
95	79.5	3.2	87.0	2.9
98.7			94.0	0.0
99	88.4	0.0		

% A	% B		Plait-points ±0.5		
	0°C	25°C		0°C	25°C
40	27.7 ± 0.2	28.3 ± 0.3	% A	37.0	40.0
45	27.6 ± 0.2	28.2 ± 0.3	% B	27.7	28.3
50	26.9 ± 0.2	27.5 ± 0.3	% C	35.3	31.7
55	25.9 ± 0.2	26.7 ± 0.3			
60	24.2 ± 0.2	25.2 ± 0.3			
65	22.1 ± 0.2	23.2 ± 0.5			
70	18.9 ± 0.3	20.4 ± 0.5			
75	14.5 ± 0.3	16.8 ± 0.5			
80	9.4 ± 0.3	13.0 ± 0.5			
85	4.0 ± 0.3	8.8 ± 0.5			
88.4	0.0				
90		3.8 ± 0.5			
94		0.0			

TABLE 7.—H₂O(A); C₂H₆O(B), ETHYL ALCOHOL; C₆H₁₂O(C), ISOAMYL ALCOHOL
Probable error, 0.2 % below 100°C; 0.5 % above; % B for various temperatures

°C	% C	40	45	50	55	60
0		29.4	27.7	25.7	23.7	21.3
15		27.5	26.4	24.6	22.6	20.3
25		26.4	25.3	23.8	21.8	19.5
40		24.7	23.7	22.5	20.5	18.4
55		23.0	22.3	21.2	19.2	17.1
70		21.2	20.7	19.5	17.7	15.7
85		19.1	18.8	17.7	16.0	14.1
100		17.0	16.6	15.7	14.0	12.4
120			13.3	12.6	11.3	9.9
140				9.5	8.2	6.8
160				5.3	4.7	3.6

°C	% C	65	70	75	80	85
0		18.5	15.6	12.4	8.6	4.9
15		17.6	14.8	11.6	8.1	4.5
25		17.0	14.1	11.0	7.6	4.0
40		15.9	13.0	10.2	6.8	3.3
55		14.8	12.1	9.2	6.0	2.6
70		13.6	11.1	8.0	5.1	1.7
85		12.2	9.7	6.7	4.0	0.4
100		10.6	8.1	5.4	2.3	
120		8.0	5.7	3.2	0.4	
140		5.3	3.1	0.7		
160		2.0				

TABLE 7.—(Continued)

°C	% A	40	45	50	55	60
0		30.5	30.2	29.7	29.1	28.4
15		28.2	28.0	27.5	26.8	26.0
25		26.8	26.6	26.1	25.4	24.5
40		25.0	24.8	24.3	23.6	22.8
55		23.3	23.2	22.7	22.0	21.1
70		21.4	21.4	20.9	20.2	19.3
85			19.0	18.9	18.5	17.9
100			17.0	16.8	16.3	15.7
120			13.5	13.5	13.2	12.8
140			10.0	10.1	10.0	9.7
160				6.1	6.1	6.0

°C	% A	65	70	75	80	85
0		27.4	25.2	21.5	17.0	12.0
15		24.8	23.2	20.6	16.8	12.1
25		23.5	22.0	19.8	16.5	12.1
40		21.8	20.5	18.5	16.0	12.0
55		20.3	19.0	17.3	15.0	11.7
70		18.5	17.5	16.0	14.0	11.1
85		17.0	16.2	14.8	13.0	10.2
100		15.0	14.2	13.2	11.7	9.2
120		12.3	11.7	11.0	10.0	8.0
140		9.2	8.7	8.0	7.1	5.7
160		5.9	5.5	5.0	4.5	3.4

°C	90 % A	95 % A	% A	% C in conjugate layer; error, ±0.5 %	
				15.5°C	28°C
0	6.5	1.3	40	11.0	9.5
15	7.2	2.0	45	14.0	12.5
25	7.3	2.4	50	18.0	16.0
40	7.4	2.5	55	22.0	20.0
55	7.3	2.6	60	27.0	25.0
70	7.0	2.5	65	33.0	30.5
85	6.4	2.3	70	40.0	37.5
100	5.8	2.0	75	48.5	45.5
120	4.9	1.0	80	60.5	57.0
140	3.4	0.1	85	71.0	68.0
160	1.5		90	80.5	78.5
			95	88.0	86.5

Plait-points ±0.5 %

	15.5°C	28°C
% A.....	52.8	55.0
% B.....	27.0	25.0
% C.....	20.2	20.0

TABLE 8.—H₂O(A); C₂H₆O(B), ETHYL ALCOHOL; C₁₀H₇Br(C), α-BROMONAPHTHALENE

x g of C are mixed with 100 g aqueous B, and the temperature determined at which the mixture becomes opaque. Table 8 shows percentage by weight of B in original aqueous solution. Probable error, 0.03 %.

°C	<i>x</i>	0.3163	0.4074	0.5015	0.6310
30				9.04	7.56
28				8.76	7.30
26			10.26	8.48	7.05
24			9.96	8.22	6.81
22			9.68	7.97	6.58

TABLE 8.—(Continued)

$^{\circ}\text{C}$ \ x	0.3163	0.4074	0.5015	0.6310
20		9.41	7.73	6.35
18		9.17	7.51	6.14
16		8.92	7.29	5.93
14		8.69	7.08	5.73
12	10.36	8.47	6.88	5.55
10	10.12	8.27	6.70	5.37
8	9.89	8.05	6.51	5.19
6	9.68	7.86	6.33	5.03
4	9.48	7.68	6.16	4.88
+ 2	9.28	7.51	6.00	4.73
0	9.09	7.34	5.85	4.59
- 2	8.91	7.18	5.71	4.46
- 4	8.73	7.03	5.58	4.33
- 6	8.58	6.88	5.45	4.23
- 8	8.42	6.75	5.33	4.13
-10	8.29	6.64	5.22	4.04

$^{\circ}\text{C}$ \ x	0.7945	1.000	1.260	1.585
30	6.40	5.48	4.81	4.42
28	6.15	5.23	4.58	4.19
26	5.90	5.00	4.35	3.98
24	5.67	4.77	4.14	3.77
22	5.44	4.54	3.93	3.57
20	5.22	4.34	3.74	3.39
18	5.01	4.14	3.55	3.20
16	4.81	3.95	3.39	3.02
14	4.61	3.77	3.20	2.86
12	4.43	3.60	3.04	2.70
10	4.27	3.45	2.87	2.55
8	4.11	3.30	2.74	2.41
6	3.96	3.16	2.60	2.27
4	3.82	3.03	2.47	2.14
+ 2	3.69	2.90	2.34	2.02
0	3.56	2.78	2.23	1.91
- 2	3.45	2.67	2.13	1.80
- 4	3.34	2.57	2.03	1.70
- 6	3.24	2.48	1.94	1.61
- 8	3.15	2.40	1.86	1.53
-10	3.07	2.32	1.78	1.46

TABLE 9.— $\text{H}_2\text{O}(\text{A})$; $\text{C}_3\text{H}_6\text{O}(\text{B})$, ALLYL ALCOHOL; SALTS (C)

% B	NaCl = C; $\text{Na}_2\text{CO}_3 = \text{C}_1$; KF = C_2 ; $\text{K}_2\text{CO}_3 = \text{C}_3$; $t = 20^{\circ}\text{C}$; error, ± 0.2 unless otherwise indicated			
	% C	% C_1	% C_2	% C_3
10			14.8*	16.0
15	16.3*	10.0	11.8	12.9
20	14.1	8.0	9.8	10.5
30	11.0	4.6	7.5	7.0
40	8.7	2.5	5.5	4.9
50	6.5	1.1†	4.0†	2.6
60	4.7	0.4†	2.2†	1.1
70	3.0		1.3†	0.5†
80				0.1

* ± 0.3 .† ± 0.1 .

TABLE 9.—(Continued)

% salt	% B	
	C_2	C_3
20	5.8*	6.8
25	4.0	4.0
30	2.0	2.0

TABLE 10.— $\text{H}_2\text{O}(\text{A})$; $\text{C}_3\text{H}_6\text{O}(\text{B})$, ACETONE; SUGARS (C)
Grams acetone soluble in 100 g of aqueous solvent originally containing tabulated percentage of the sugar named; probable error, 0.1 % of amount of acetone

% sugar		10	20	30	40	50
Sugar						
Dextrose	15°C.....	736.7	255.3	157.5	86.95	36.16
	25°C.....	747.9	247.7	149.8	79.57	33.02
	35°C.....	761.5	240.8	142.5	74.03	31.18
Maltose	15°C.....	353.6	185.4	119.9	78.35	46.17
	25°C.....	348.1	181.2	116.0	74.73	42.95
	35°C.....	342.0	176.9	112.4	70.53	39.82
Sucrose	15°C.....	597.2	272.5	172.4		
	25°C.....	581.8	263.2	162.5		
	35°C.....	574.8	251.8	150.6		

% sucrose	20°C	25°C	30°C
40	96.44	92.76	89.84
45	71.92	68.81	65.72
50	50.83	48.13	45.85
55	35.78	33.81	32.54
60	25.17	24.18	23.35
65	18.33	17.68	17.09
70	13.22	12.82	12.53

TABLE 11.— $\text{H}_2\text{O}(\text{A})$; $\text{C}_3\text{H}_6\text{O}(\text{B})$, ACETONE; $\text{C}_7\text{H}_8(\text{C})$, TOLUENE
Probable error, 0.2 %

% A	% B		
	0°C	20°C	30°C
0.5	29.2	23.5	
1.0	39.0	33.1	
1.5	45.2	40.0	37.0
2.0	49.4	44.4	41.9
2.5	52.6	48.1	45.9
3.0	55.4	51.1	48.5
4.0	59.2	55.4	52.9
5.0	61.8	58.4	56.4
7.0	64.9	62.4	60.7
10.0	67.0	65.0	64.0
15.0	67.5	66.0	65.3
20.0	66.4	65.1	64.5
25.0	64.9	63.5	62.8
30.0	62.9	61.5	
% C	0°C	20°C	30°C
0.4			28.1
0.5	38.5	34.3	31.2
1.0	45.5	42.0	39.6
1.5	49.7	46.4	44.1
2.0	52.4	49.7	47.2
3.0	56.0	53.2	51.0
4.0	58.8	55.5	53.9
5.0	60.4	57.4	56.0
6.0		59.0	
7.0			58.7
10.0			61.3

Fig 2 Isotherms
Alloys
Probable error -- see introduction

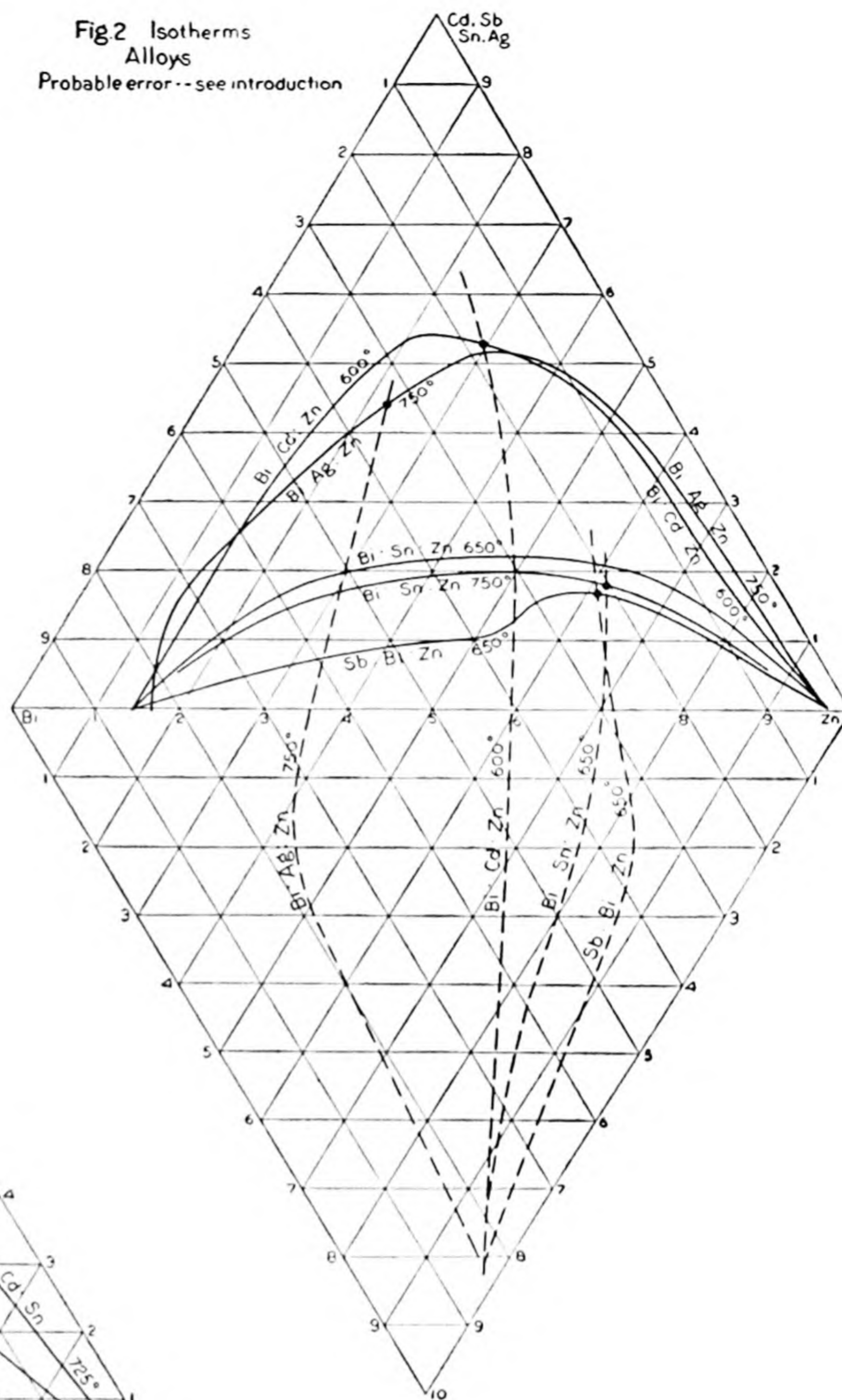


Fig 3 Isotherms
Alloys
Probable error -- see introduction

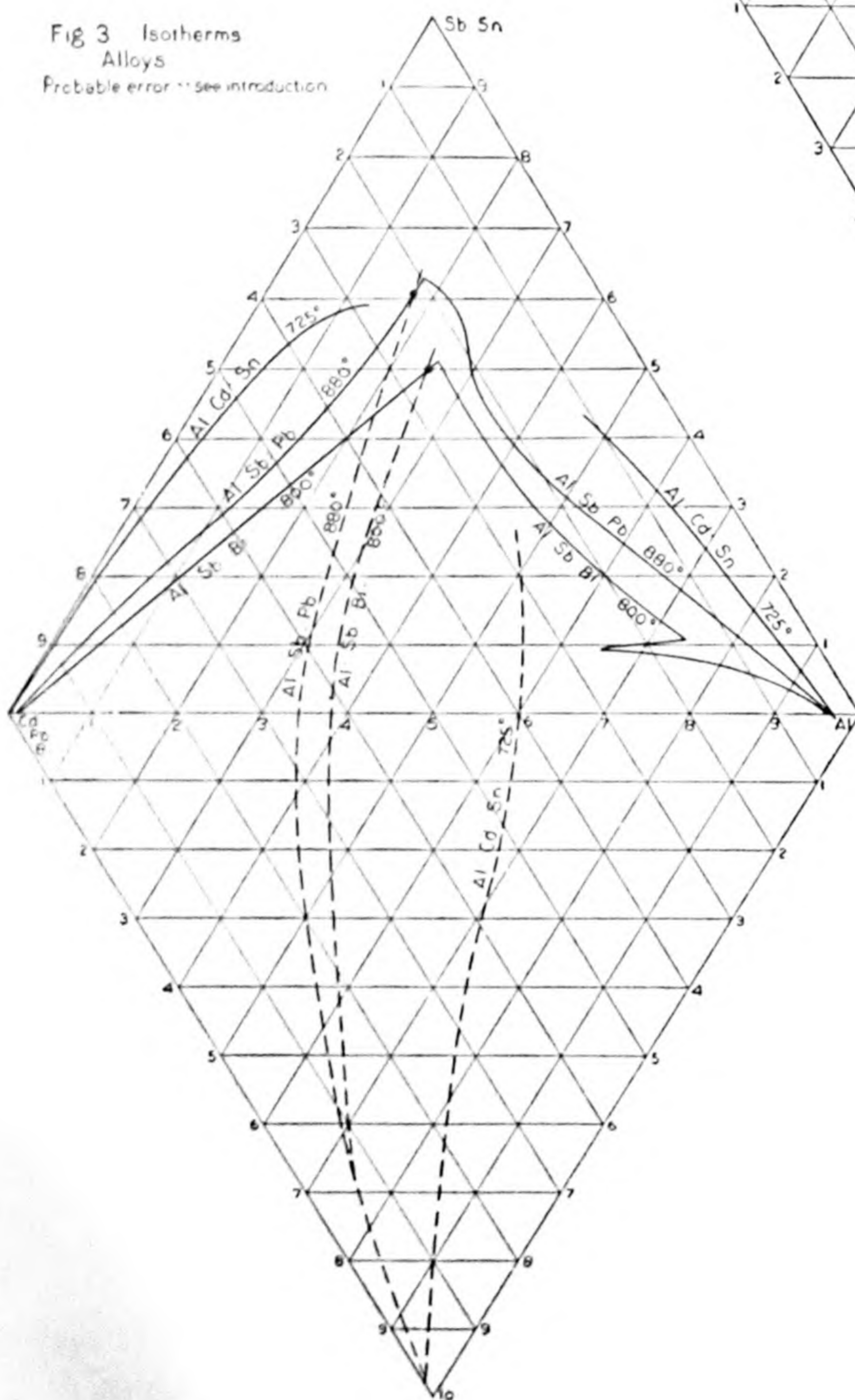


Fig. 4 Isotherms
Alloys
Probable error -- see introduction

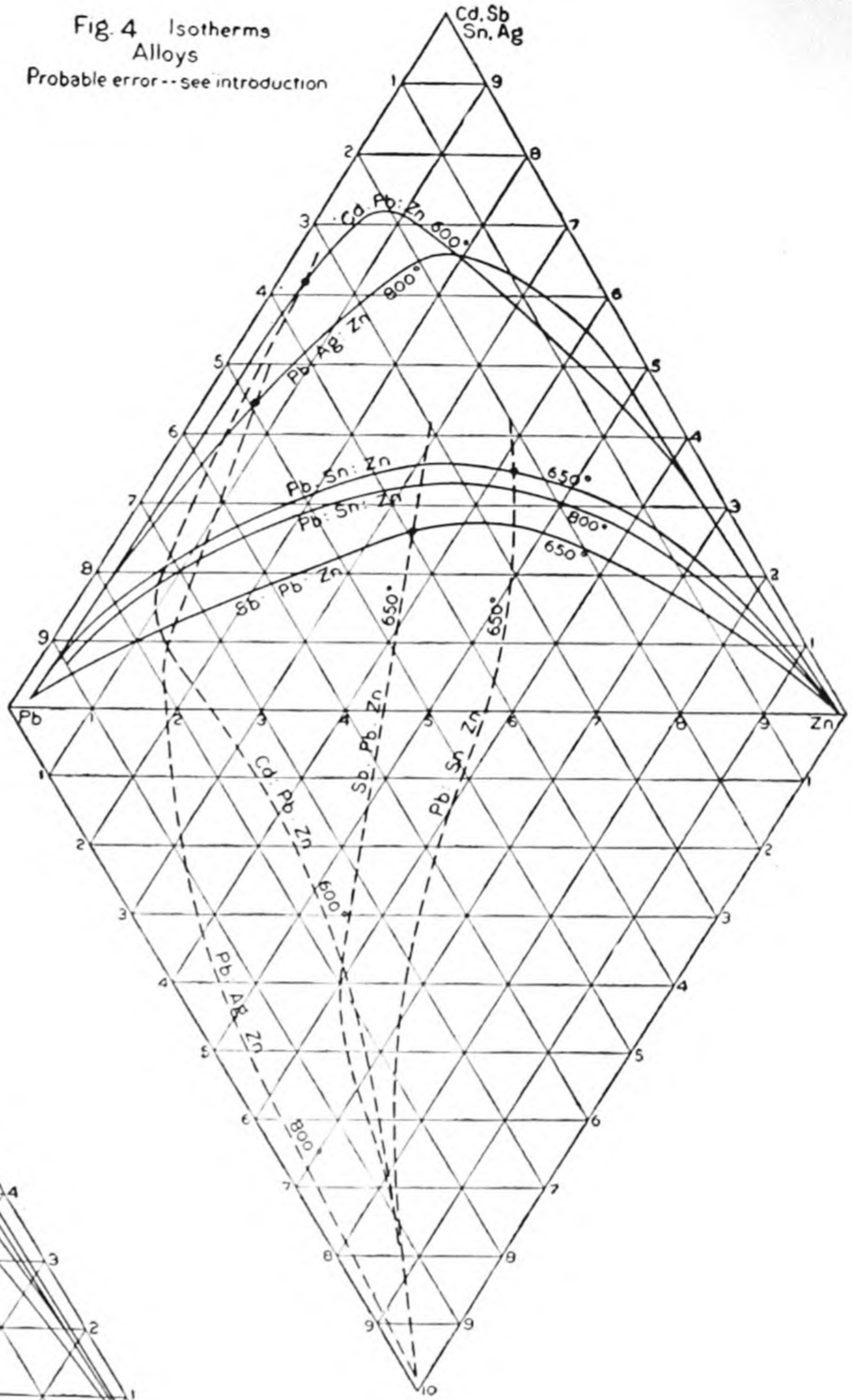
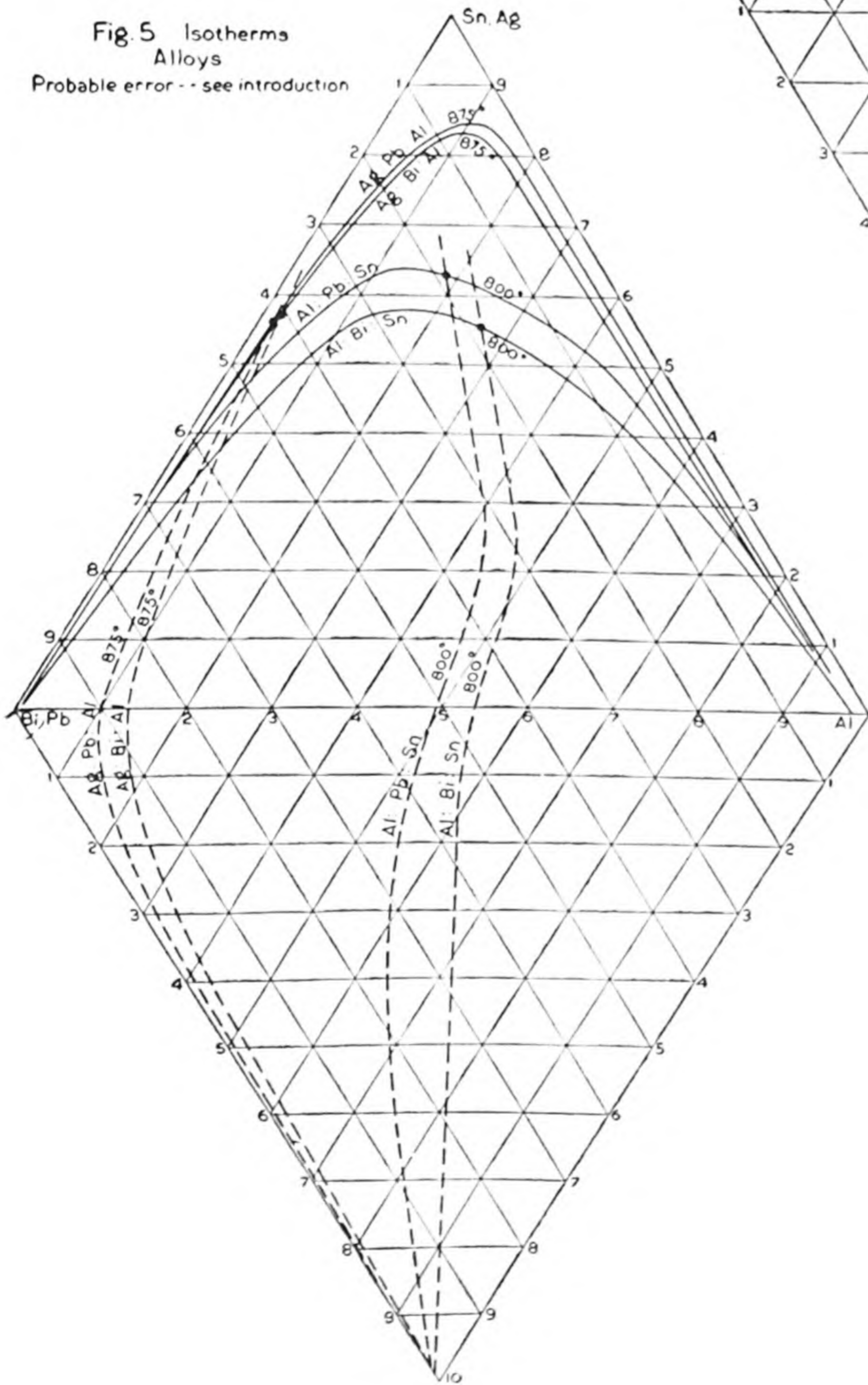


Fig. 5 Isotherms
Alloys
Probable error -- see introduction



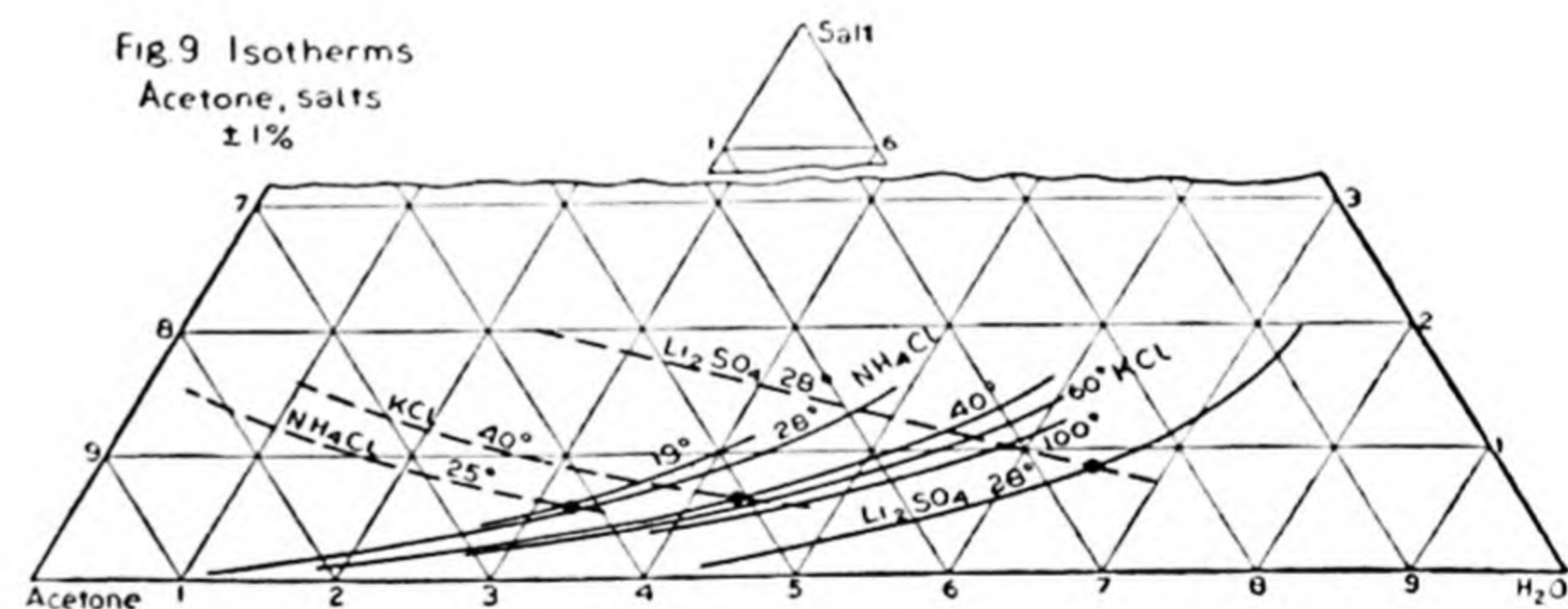
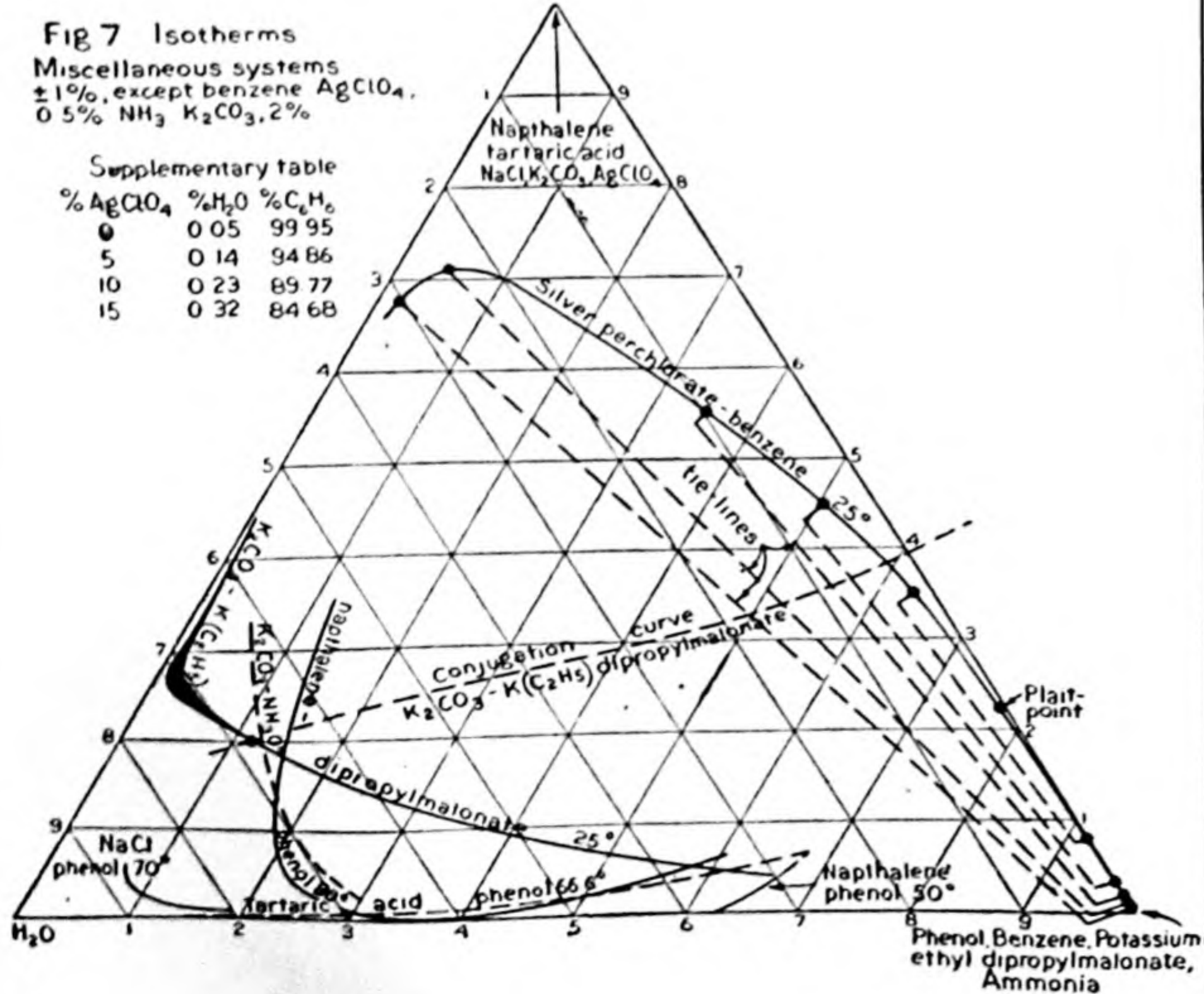
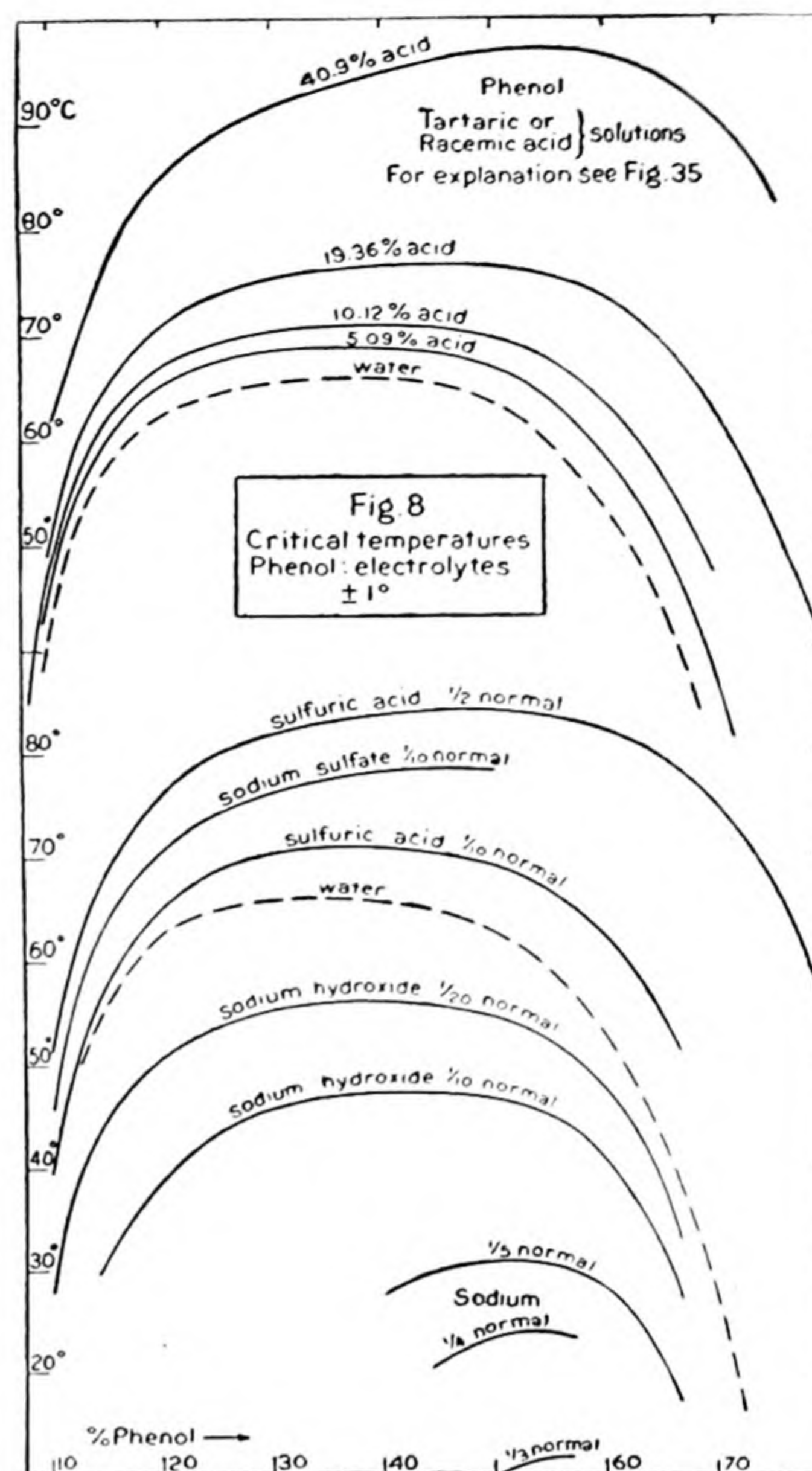
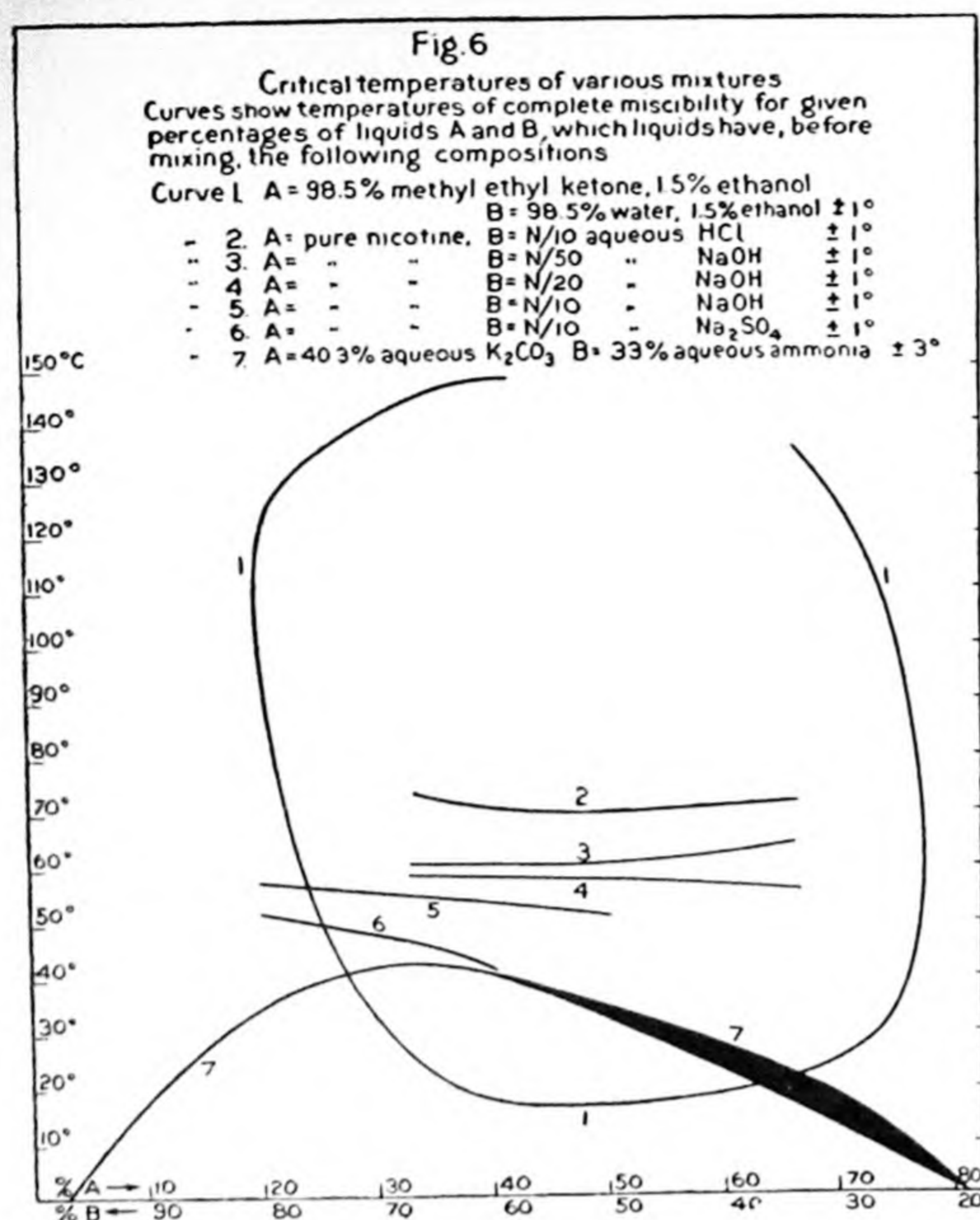


TABLE 12.—H₂O(A); C₃H₈O(B), ACETONE; SALTS (C)
C = Na₂CO₃; $t = 25^\circ\text{C}$; probable error, 0.2%

% B.....	2.8	5	10	15	20	30
% C.....	20	17.0	12.5	9.4	6.7	2.8
C = KF; C ₁ = K ₂ CO ₃ ; error, 0.2% unless otherwise indicated						
% B	$t = 20^\circ\text{C}$					$t = 25^\circ\text{C}$
	% C	% (C) _c ± 0.5	% C ₁	% (C ₁) _c	% C ₁	
5	21.5*			1.5		
10	15.9		17.2	4.5	16.4	
15	12.7		13.5	7.8	13.0	
20	10.5		10.5	10.3	10.3	

* ± 0.3 .

Continued on p. 413

Fig.10 Isotherms
Acetone salts
 $\pm 1\%$

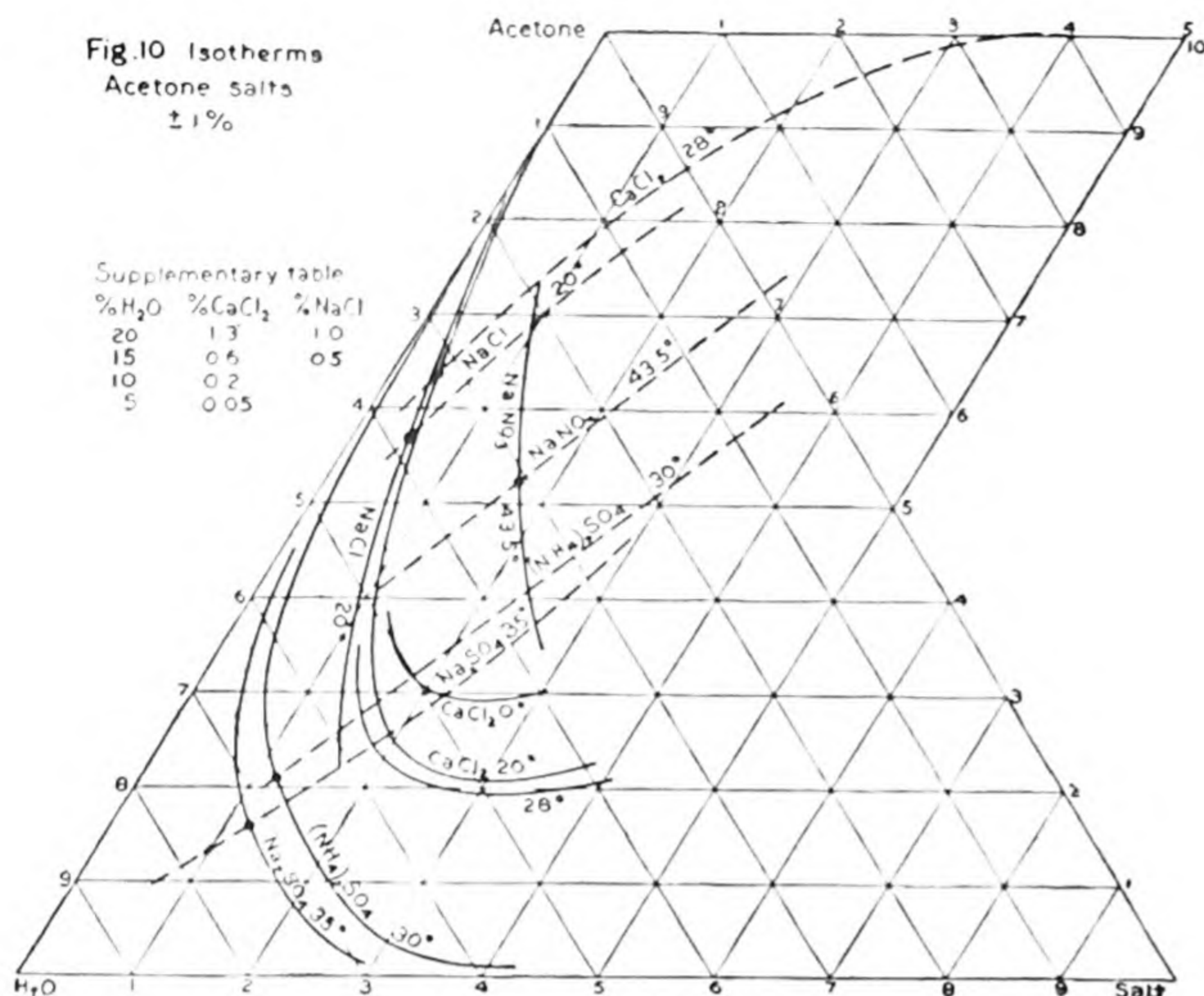


Fig.11 Isotherms
Alcohols: Carbon tetrachloride
 $\pm 0.5\%$, except Ethanol, $35\% \pm 1\%$

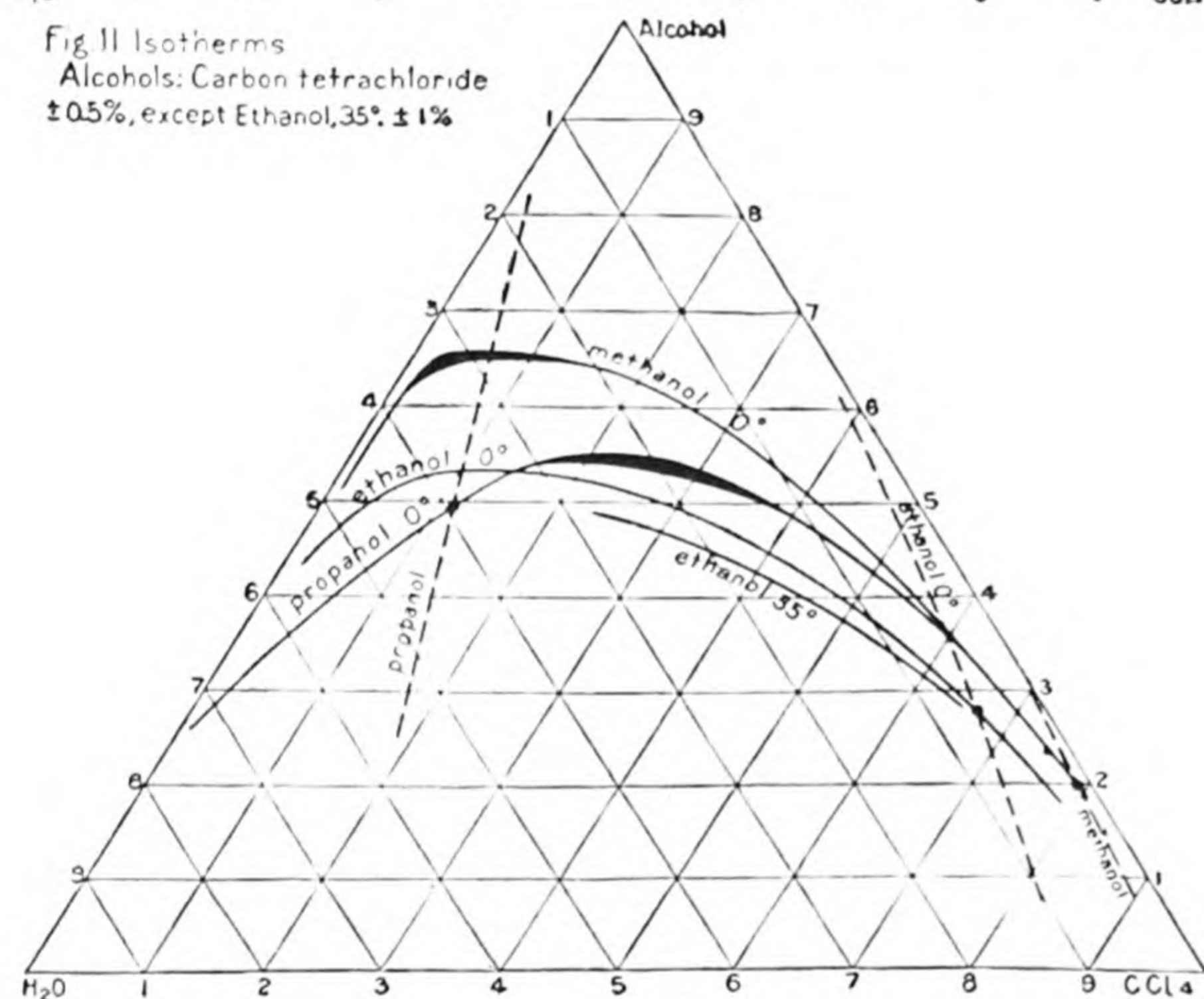


Fig.12 Isotherms
Ethanol: various
Carbon disulfide 0° and $20^\circ \pm 1\%$
75° $\pm 2\%$
Oleic acid 25° $\pm 0.5\%$
Ethyl mono-, di-, or trichloroacetate $\pm 1.5\%$

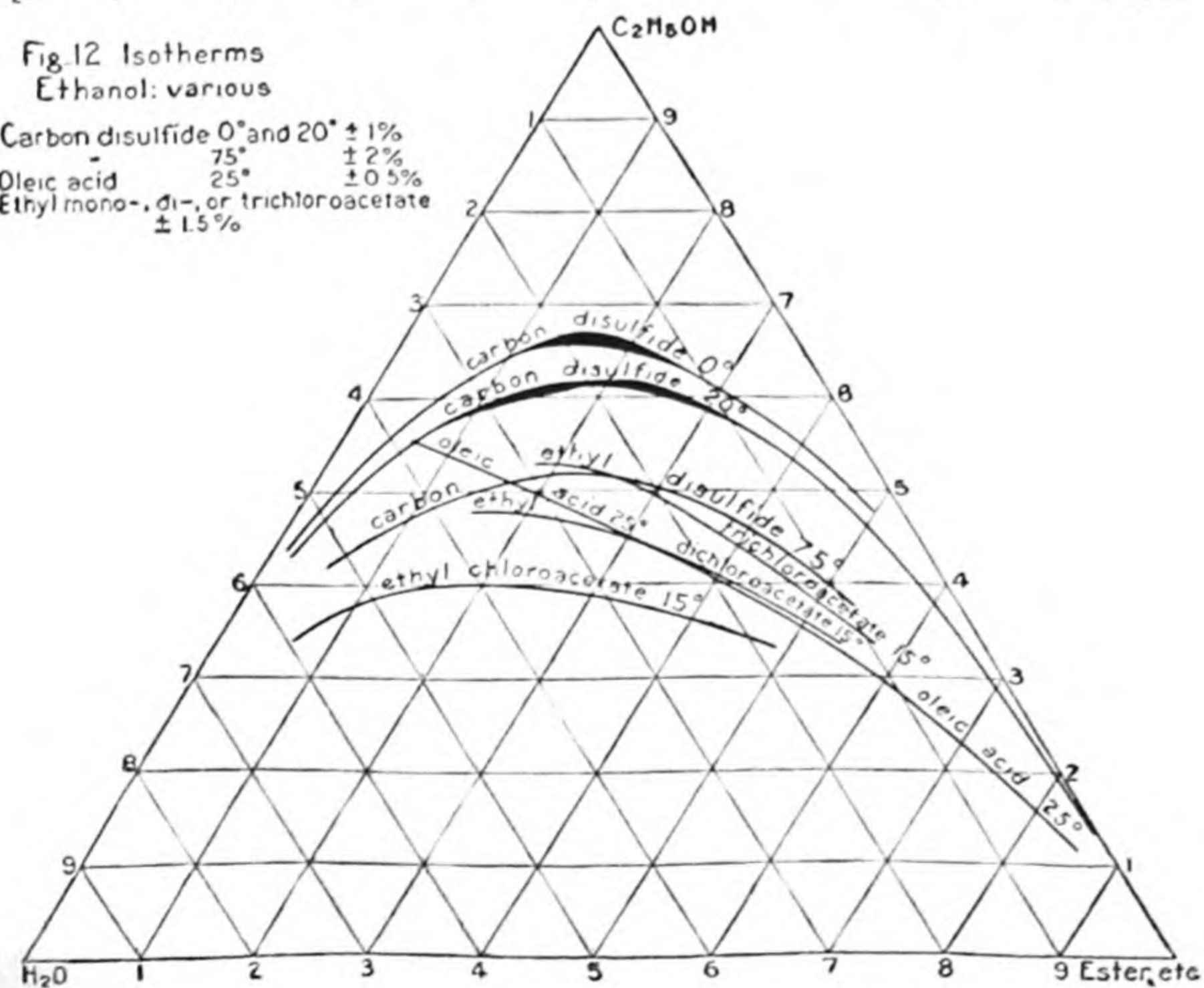


Fig.13 Isotherms
Alcohols or acetone: chloroform
 $\pm 0.5\%$

Note: Chloroform containing up to 50% propanol is in equilibrium with pure water.

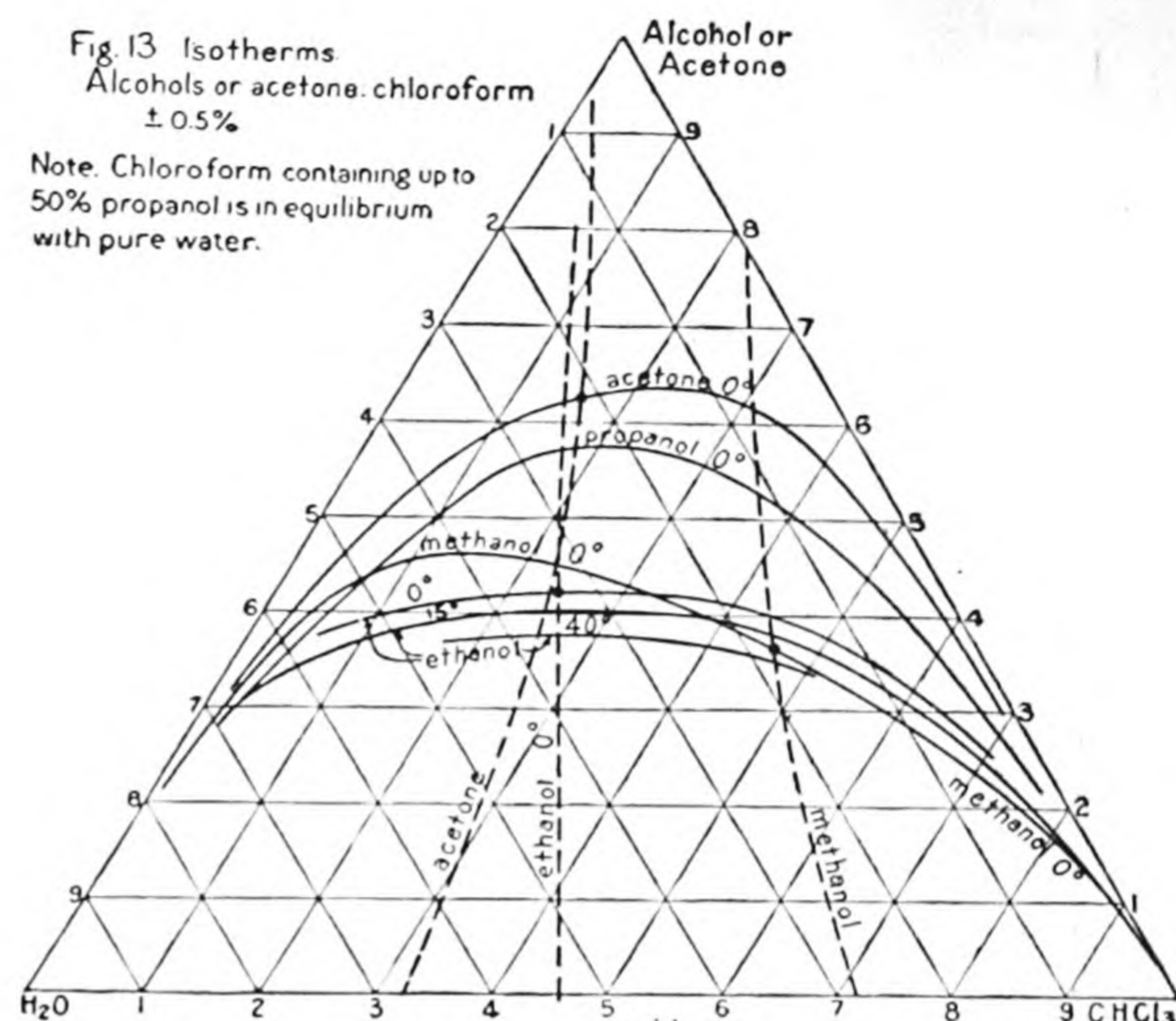


Fig.14 Isotherms
Acids: Various
 $\pm 1\%$ except B and C: A, $\pm 0.5\%$

A = Acetic acid
B = Benzene
C = Chloroform
E = Ether
F = Formic acid
H = Hydrochloric acid
P = Propionic acid

Note: In system H:E, ether layer contains less than 2% HCl.

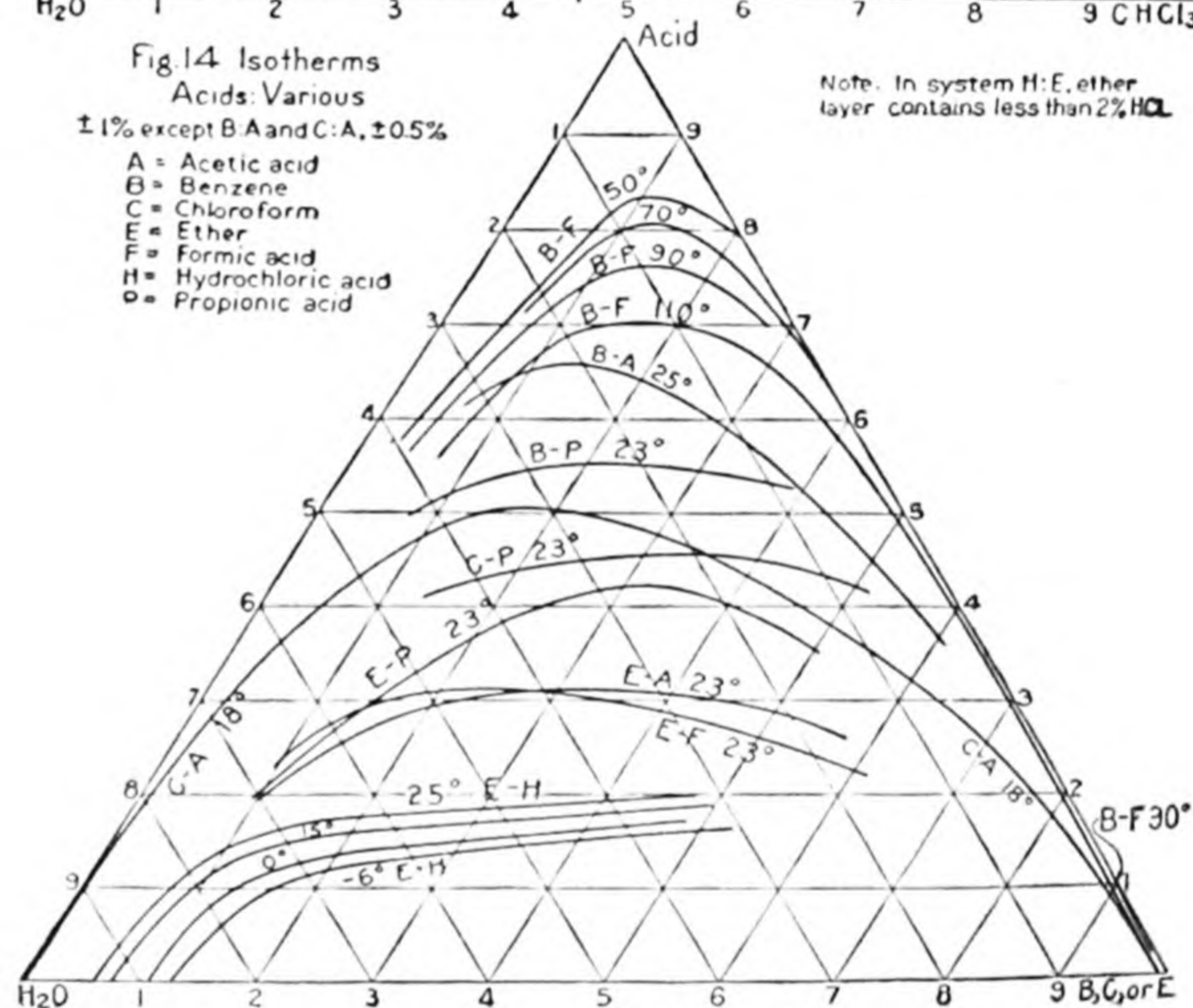
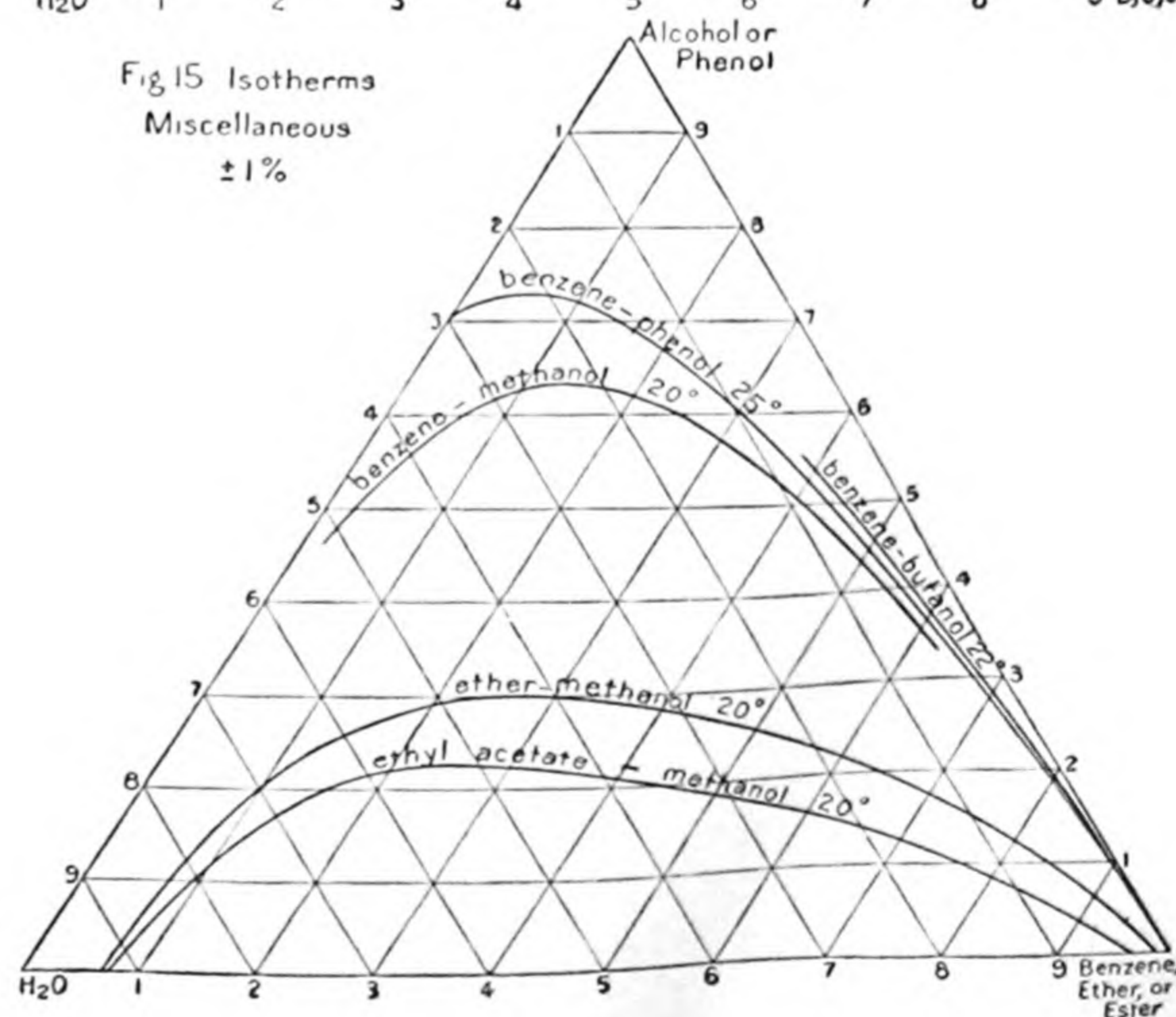


Fig.15 Isotherms
Miscellaneous
 $\pm 1\%$



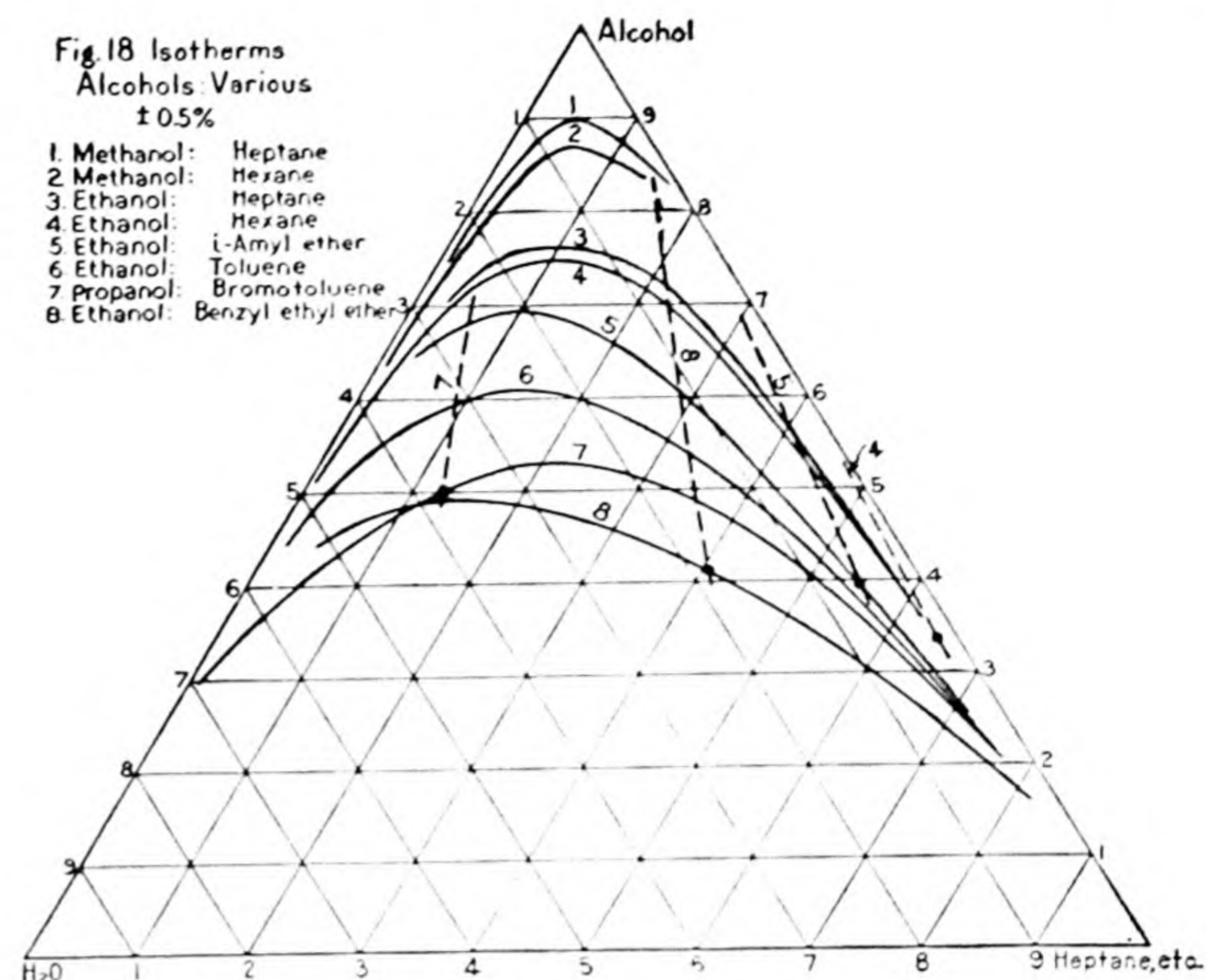
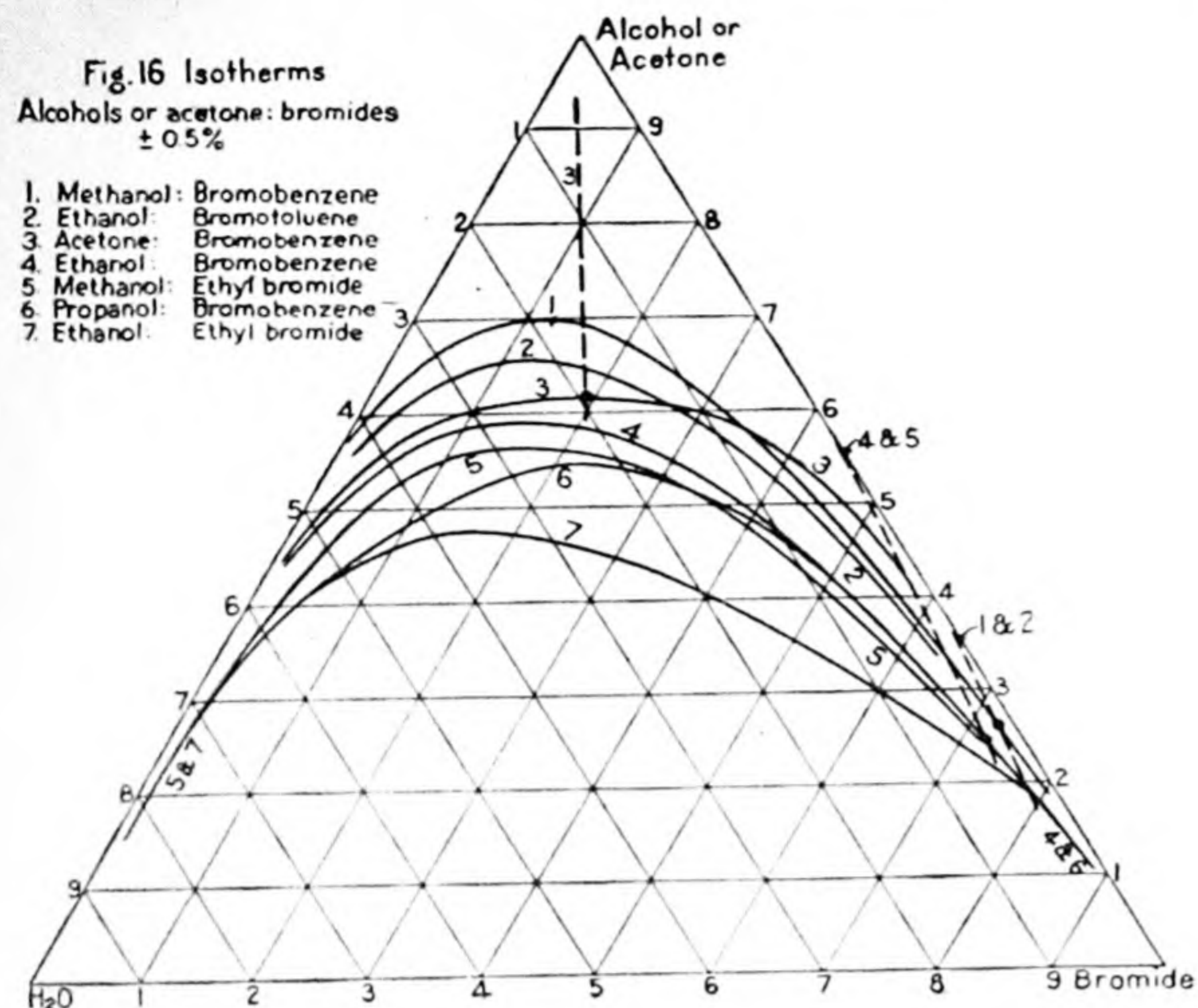


Fig. 19 Isotherms
Ethanol: Halides
 $\pm 0.5\%$

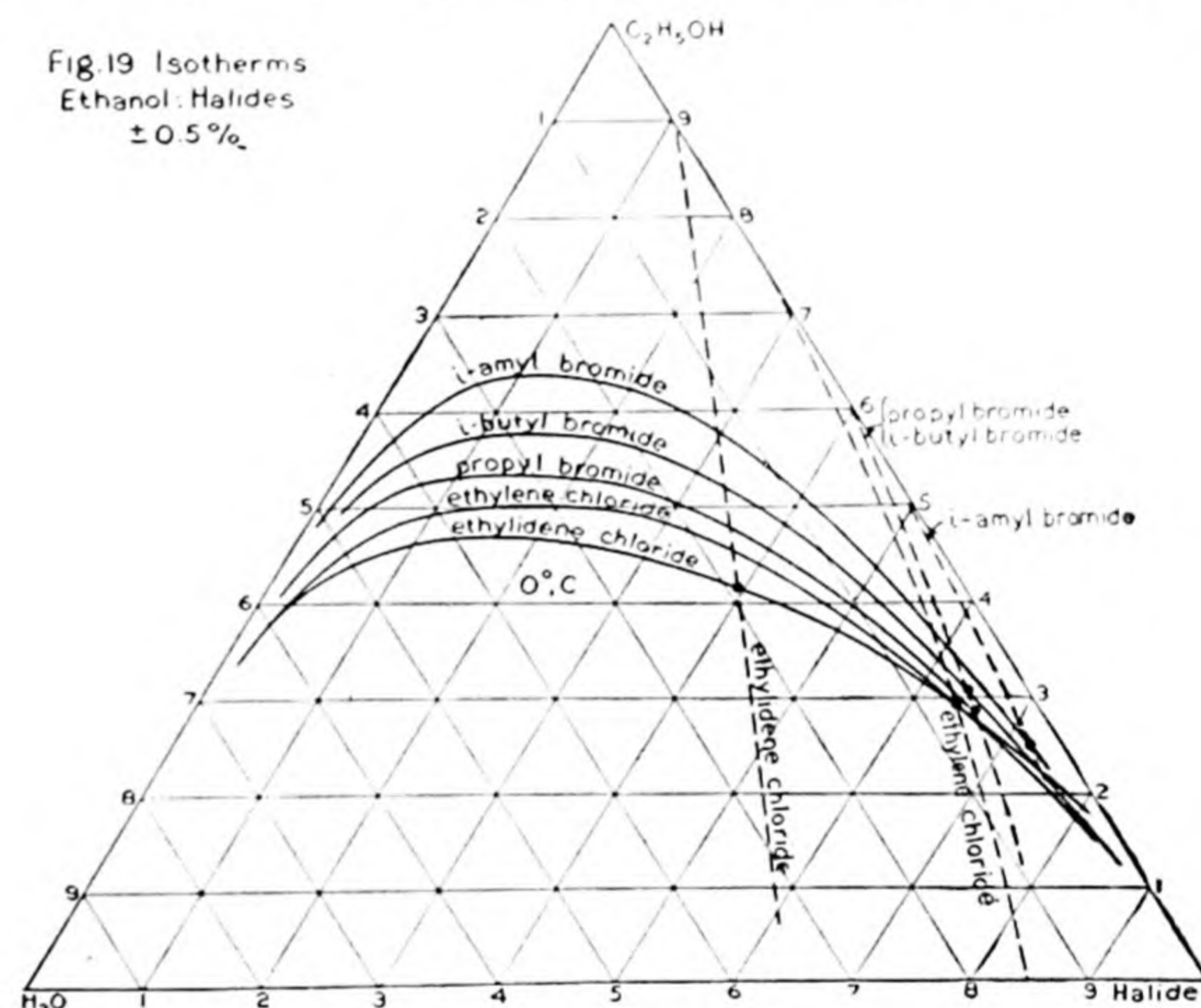


Fig. 20 Isotherms
Acetic acid, epichloro hydrin
0° and 10°, $\pm 0.5\%$ higher
temperatures $\pm 1\%$

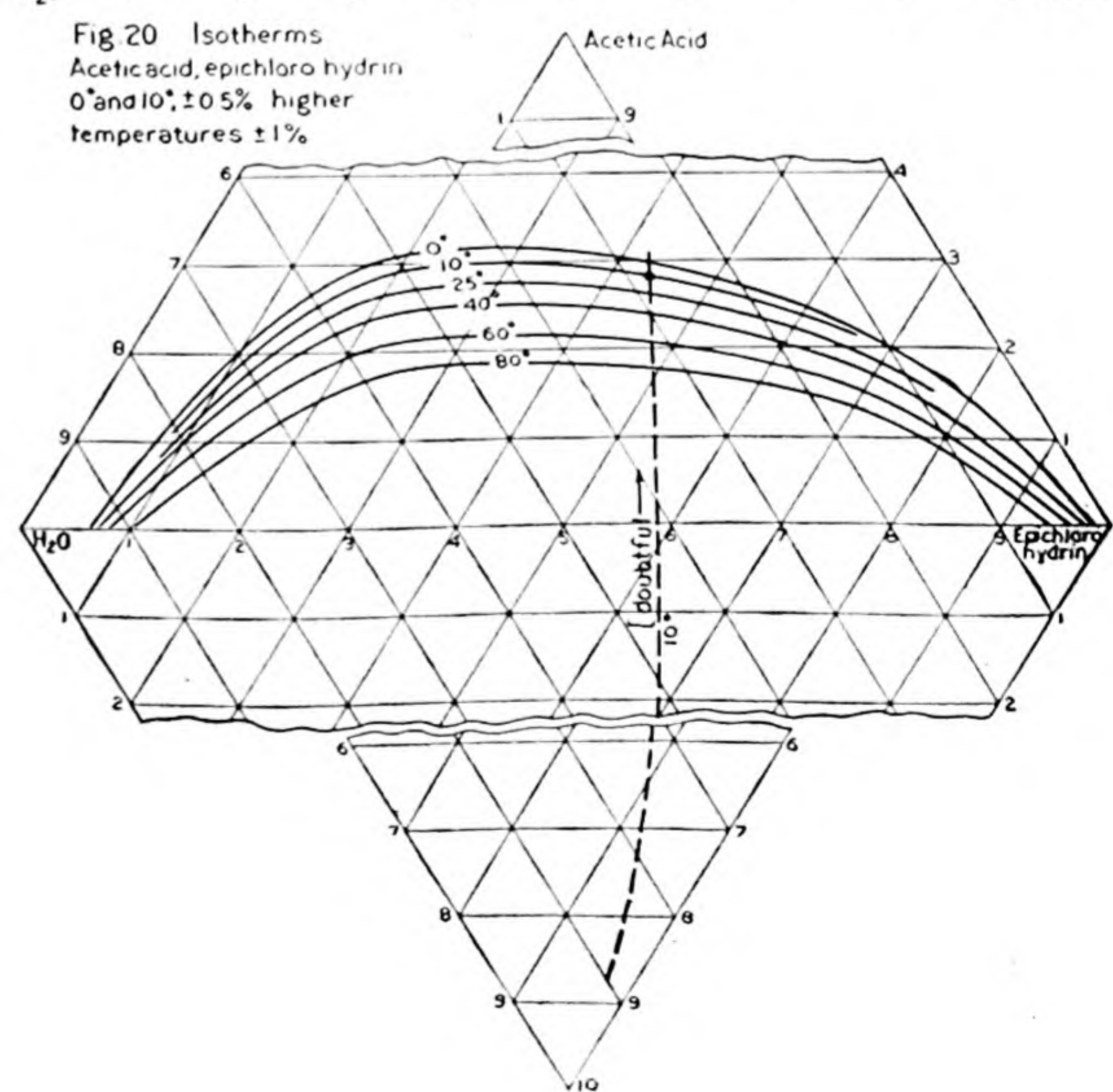


Fig. 17 Isotherms
Malonic acid: Ether and Methanol:
i-Amyl alcohol (16% active)
 $\pm 0.5\%$

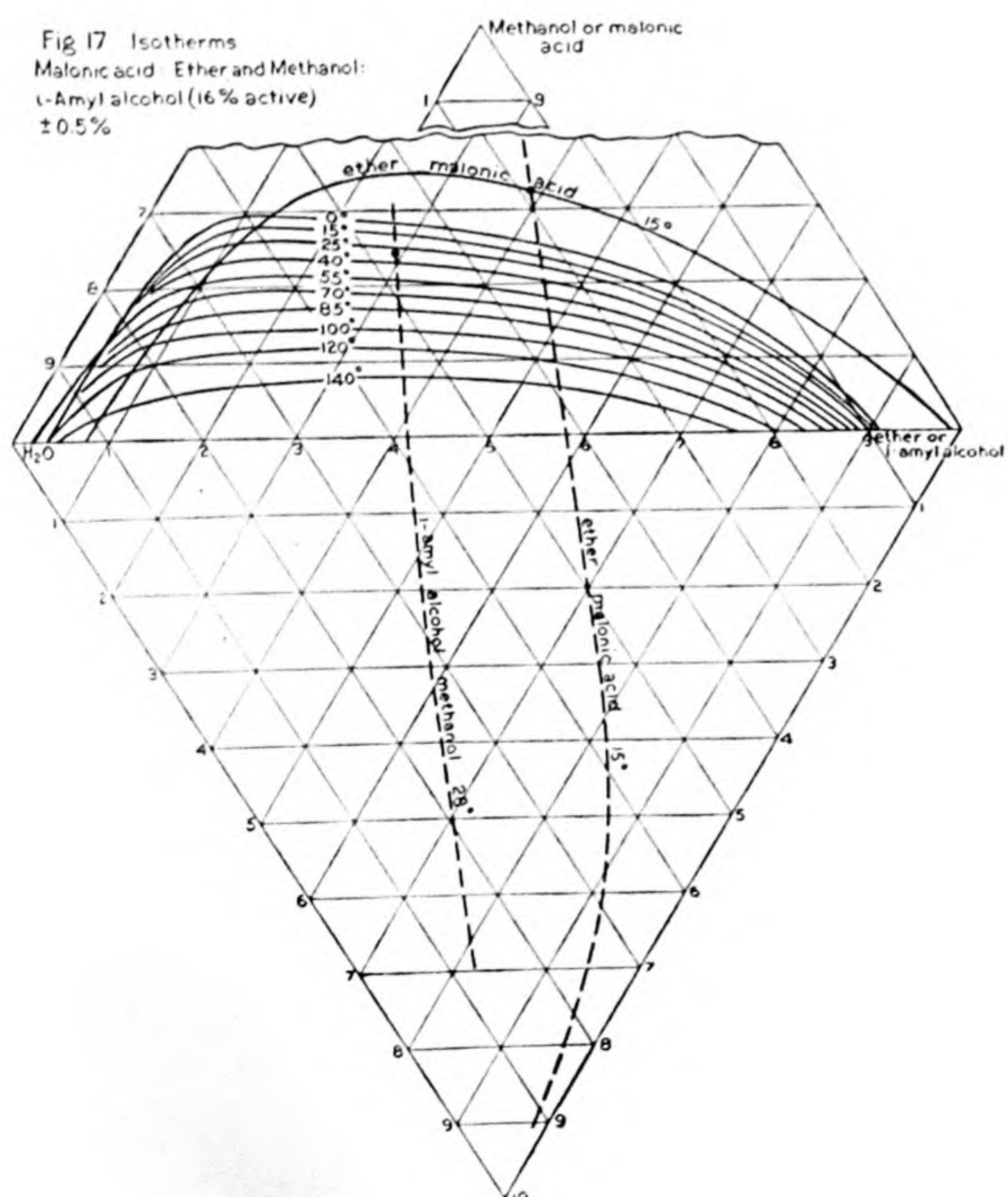


Fig.21 Isotherms

Lower alcohols: higher alcohols, etc
 $\pm 0.5\%$ except
 Propyl: butyl, i-propyl: butyl
 $\pm 1^\circ$

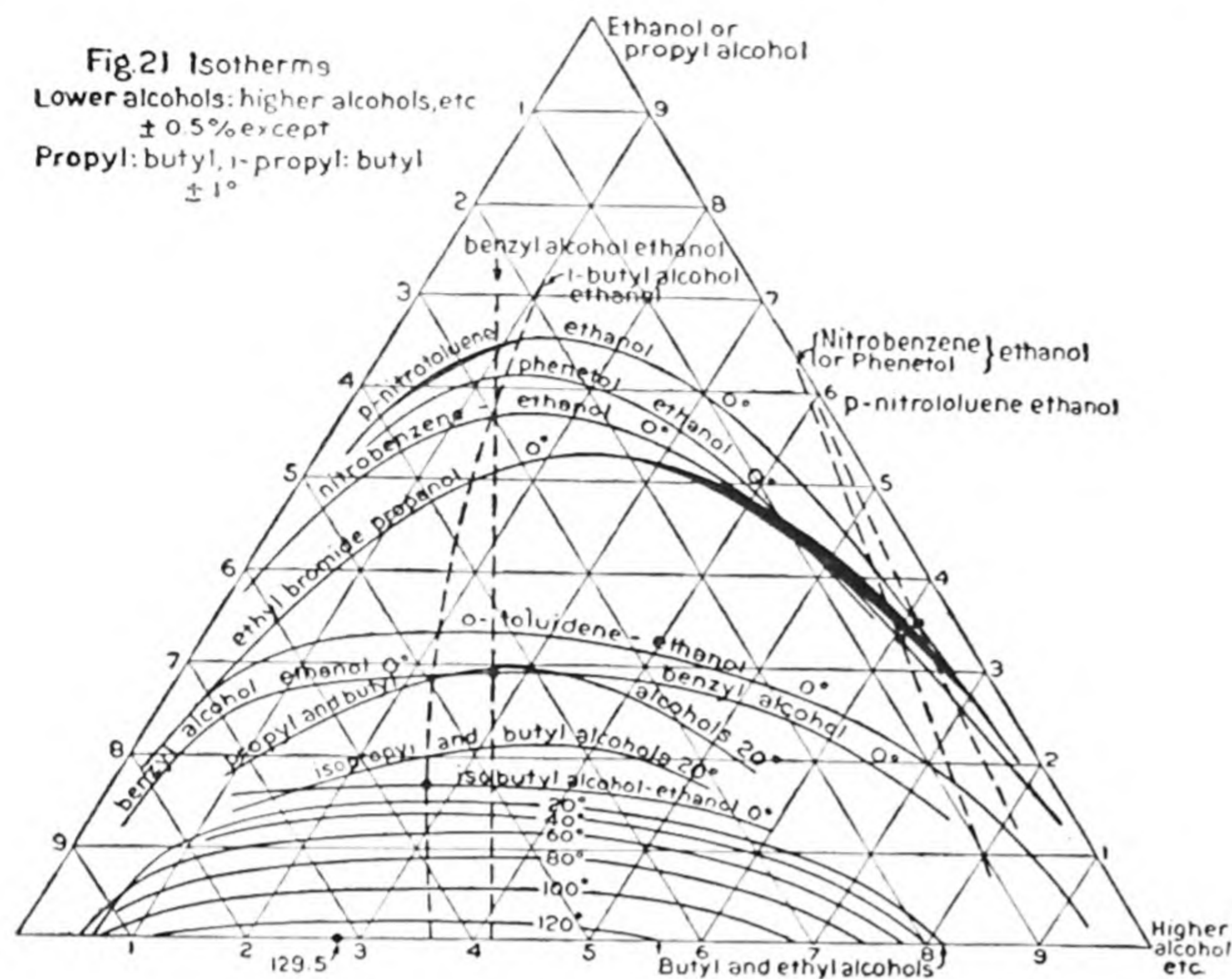


Fig.24 Isotherms

Ethanol: Acetates or Salicylates
 $\pm 1\%$ except benzyl and ethyl
 acetates $\pm 0.5\%$

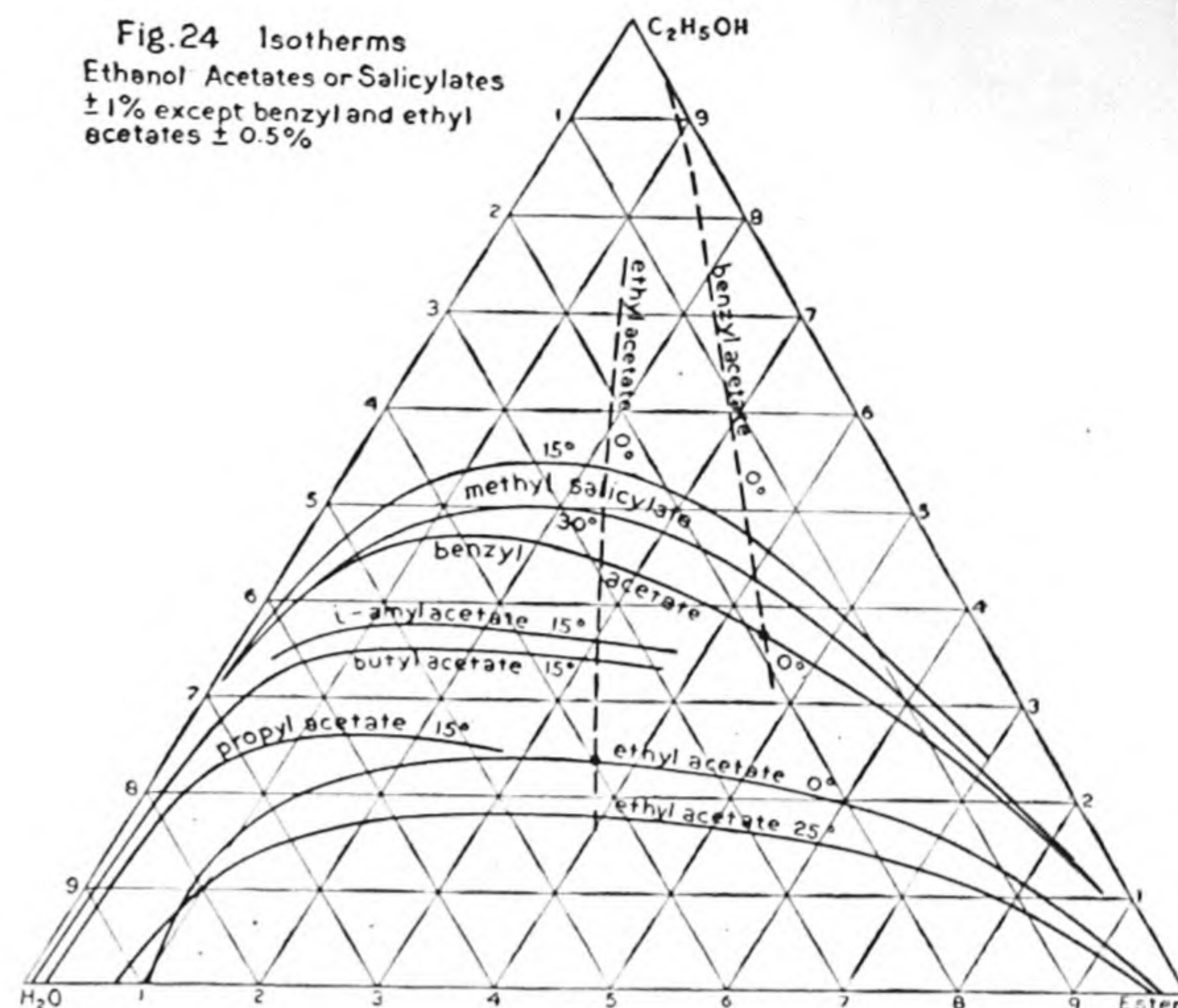


Fig.22 Isotherms

Ethanol: Succinyl nitrile
 Probable error $\pm 1\%$
 Singular points $\pm 3\%$, thus:

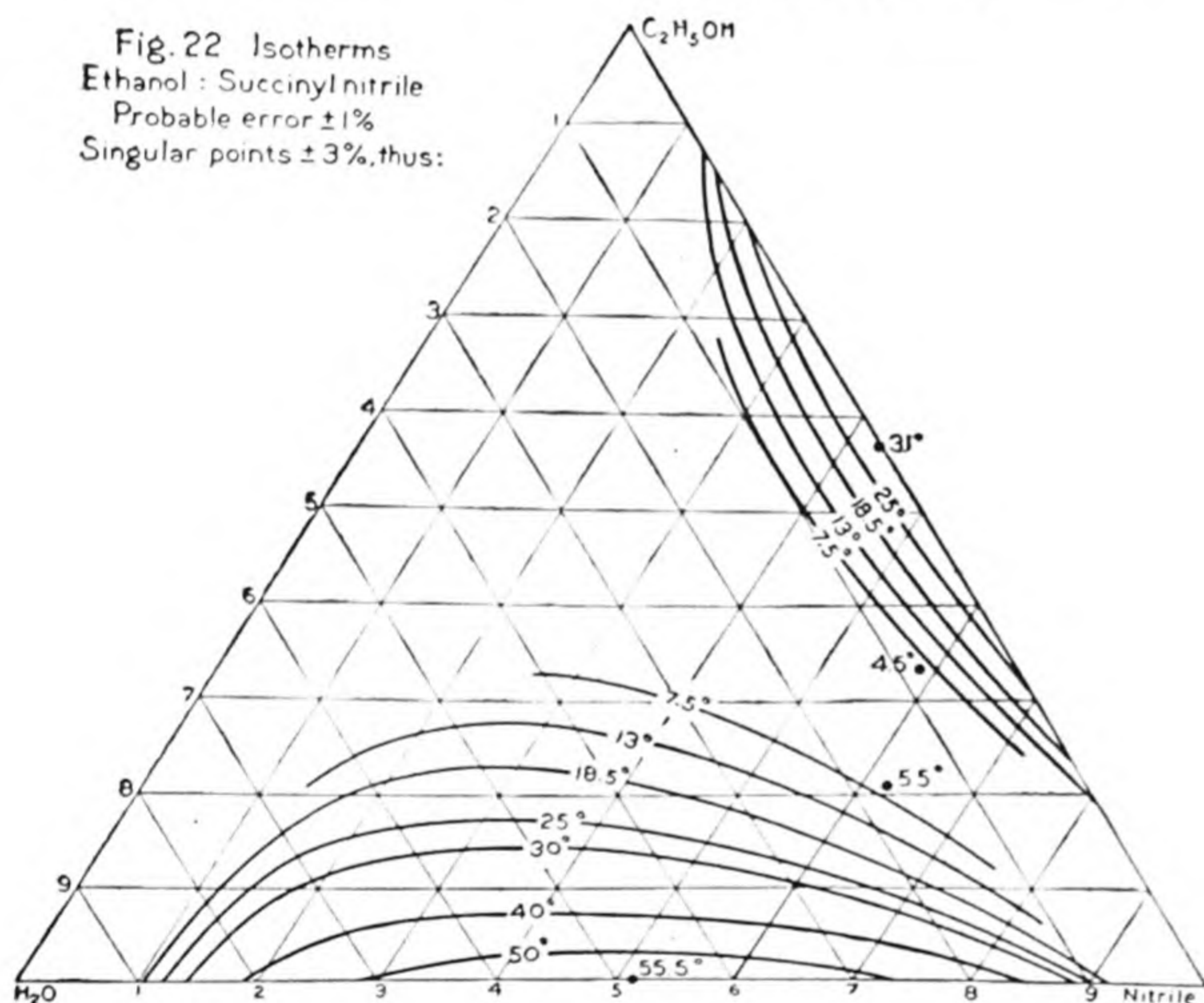


Fig.25 Isotherms

Ethanol: Propionates
 Probable errors as indicated.

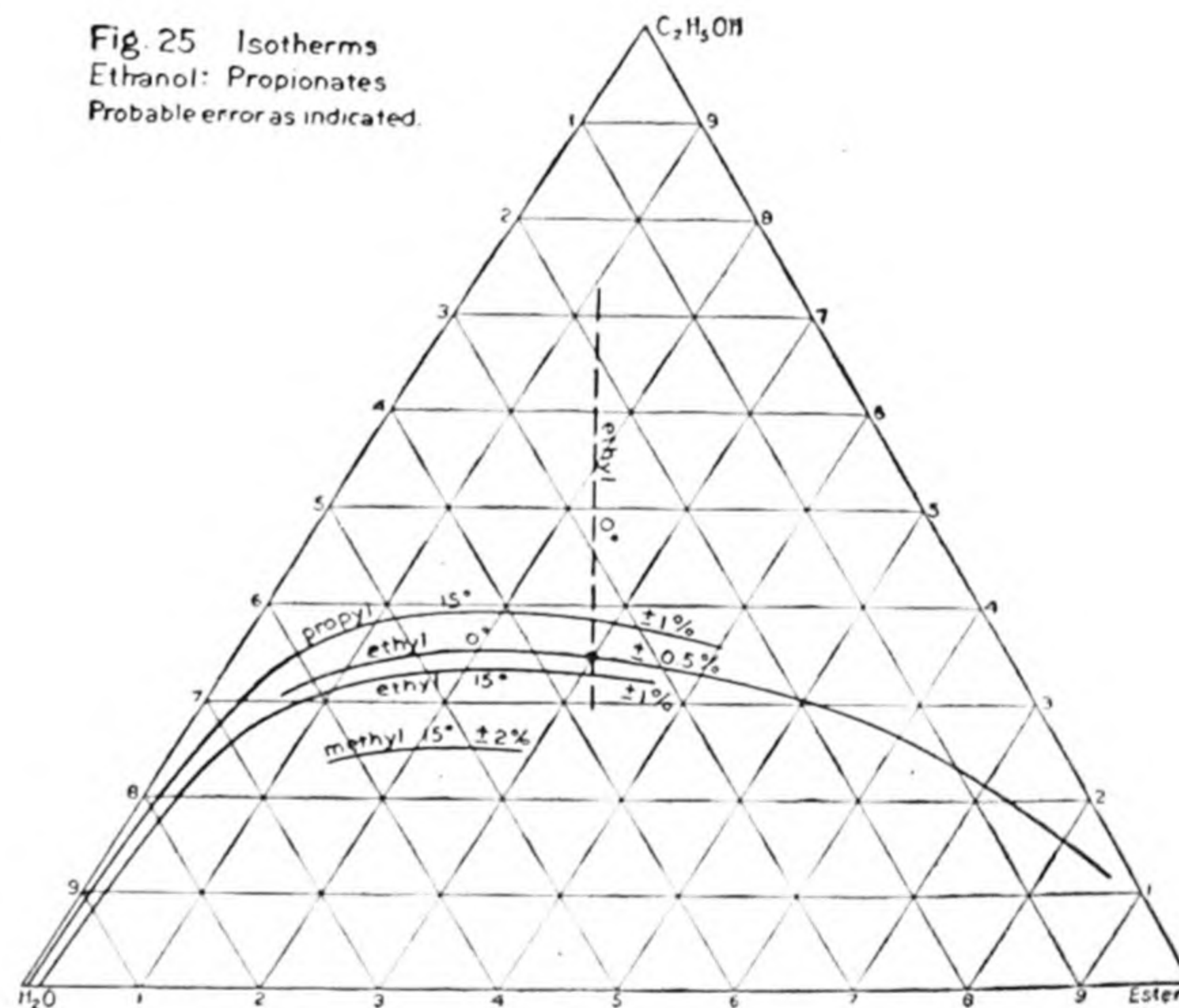


Fig.23 Isotherms

Aniline: Phenol
 $\pm 1\%$

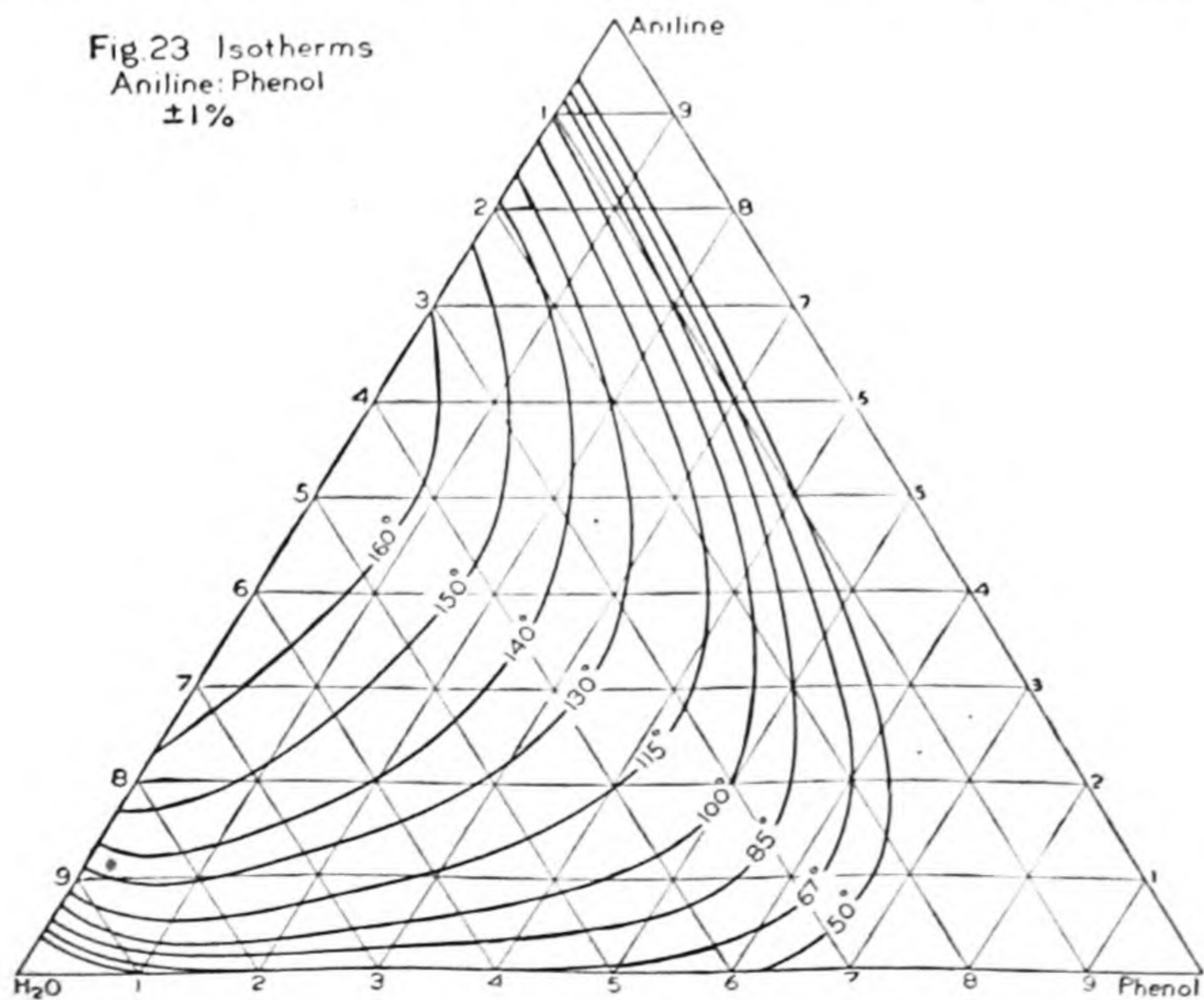


Fig.26 Isotherms

Ethanol: Formates or Valerates
 $\pm 1\%$

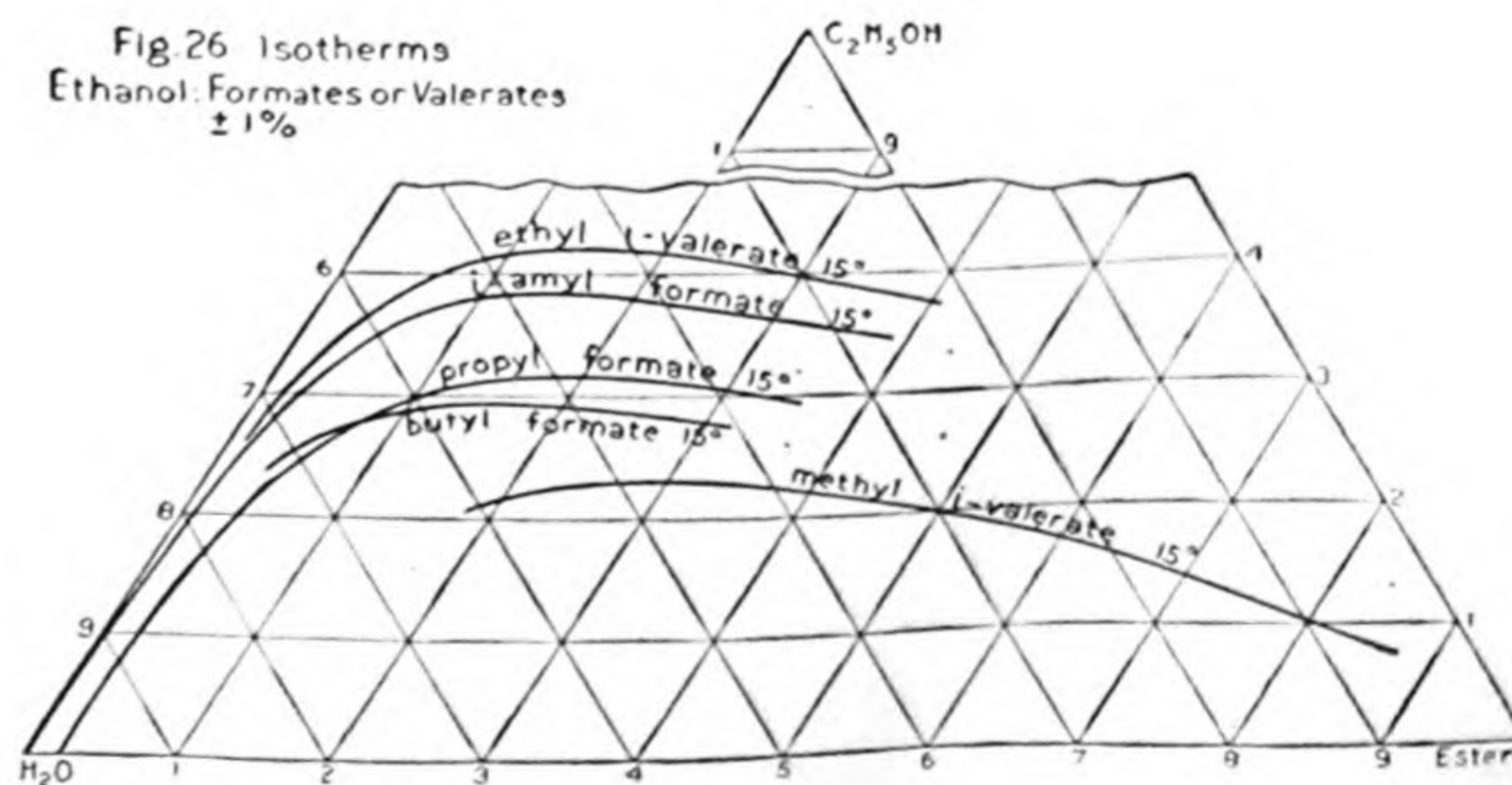


Fig. 27 Isotherms

Ethanol: various

 $\pm 0.5\%$ except curves 7, 8, 19, $\pm 1\%$

1. Pinene 0°
 2. Mesitylene 0°
 3. o-Xylene 0°
 4. m-Xylene 0°
 5. " 19°
 6. " 41°
 7. " 63°
 8. " 100°
 9. p-Xylene 0°

10. Methylaniline 0°
 11. Benzaldehyde 0°
 12. Diethyl ketone 0°
 13. Triethylamine 70°
 14. " 60°
 15. " 50°
 16. " 40°
 17. " 35°
 18. " 30.5°
 19. " 25°

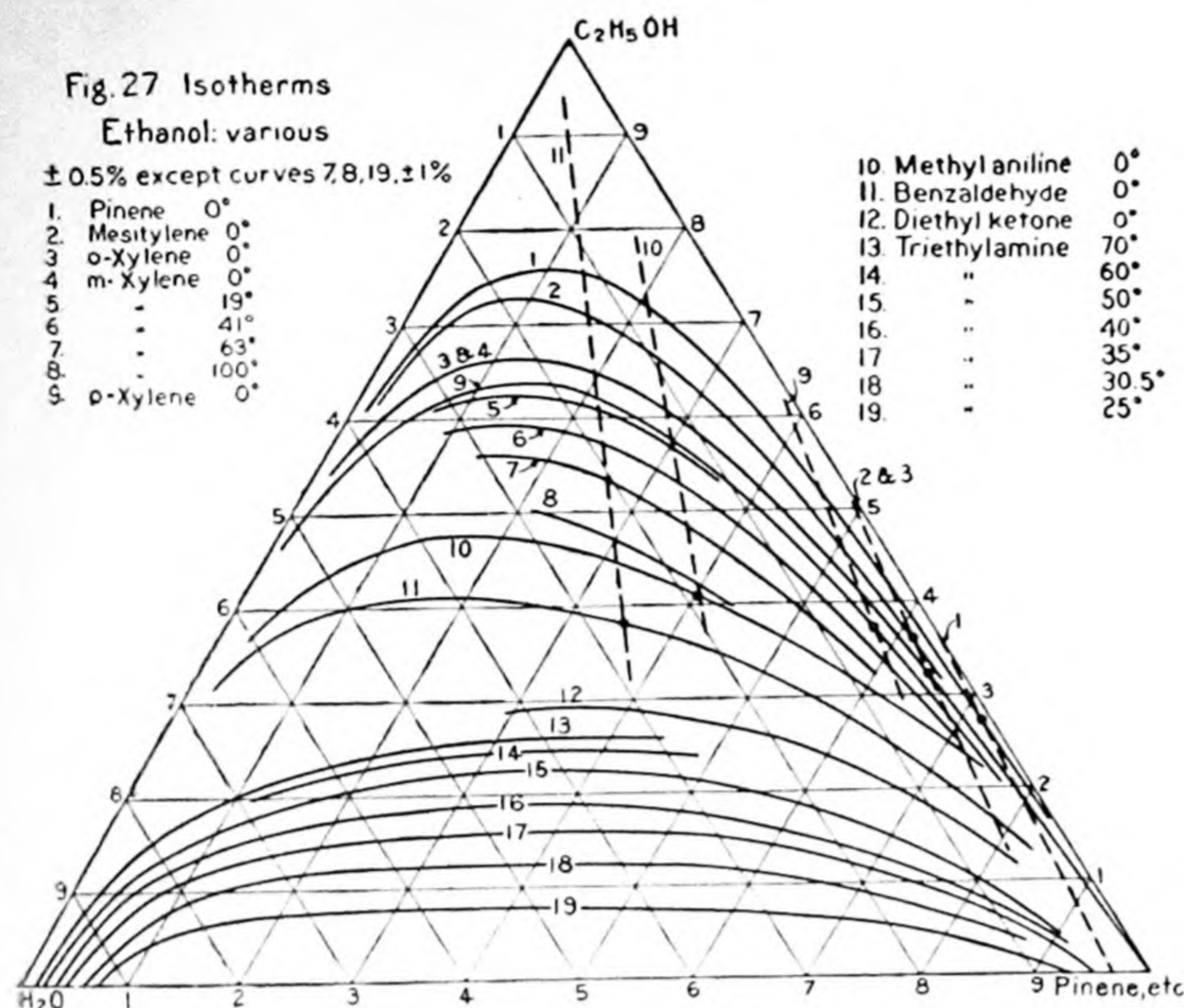


Fig. 28 Isotherms

Ethanol Butyrates

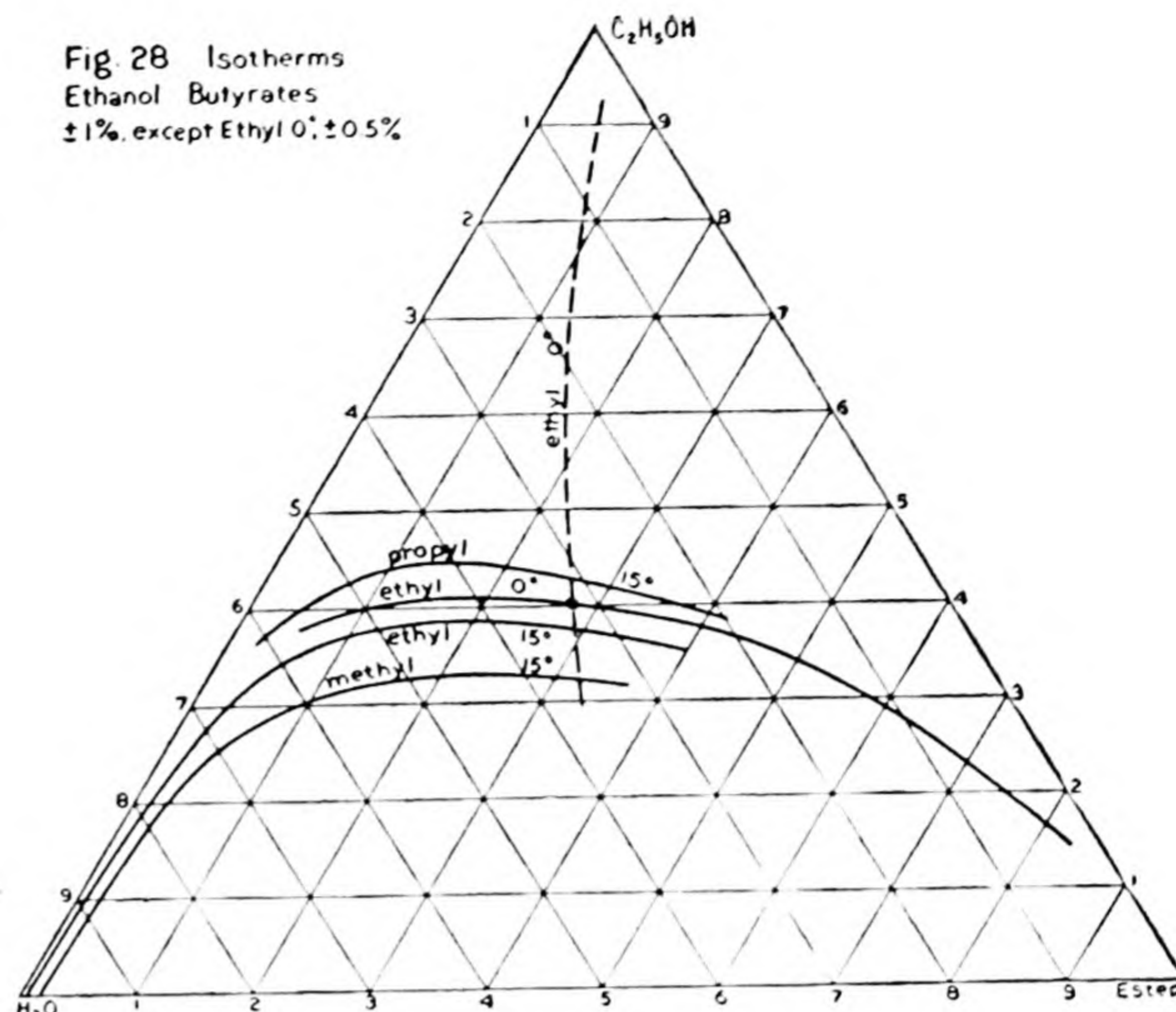
 $\pm 1\%$, except Ethyl 0°; $\pm 0.5\%$ 

Fig. 29 Isotherms

Miscellaneous

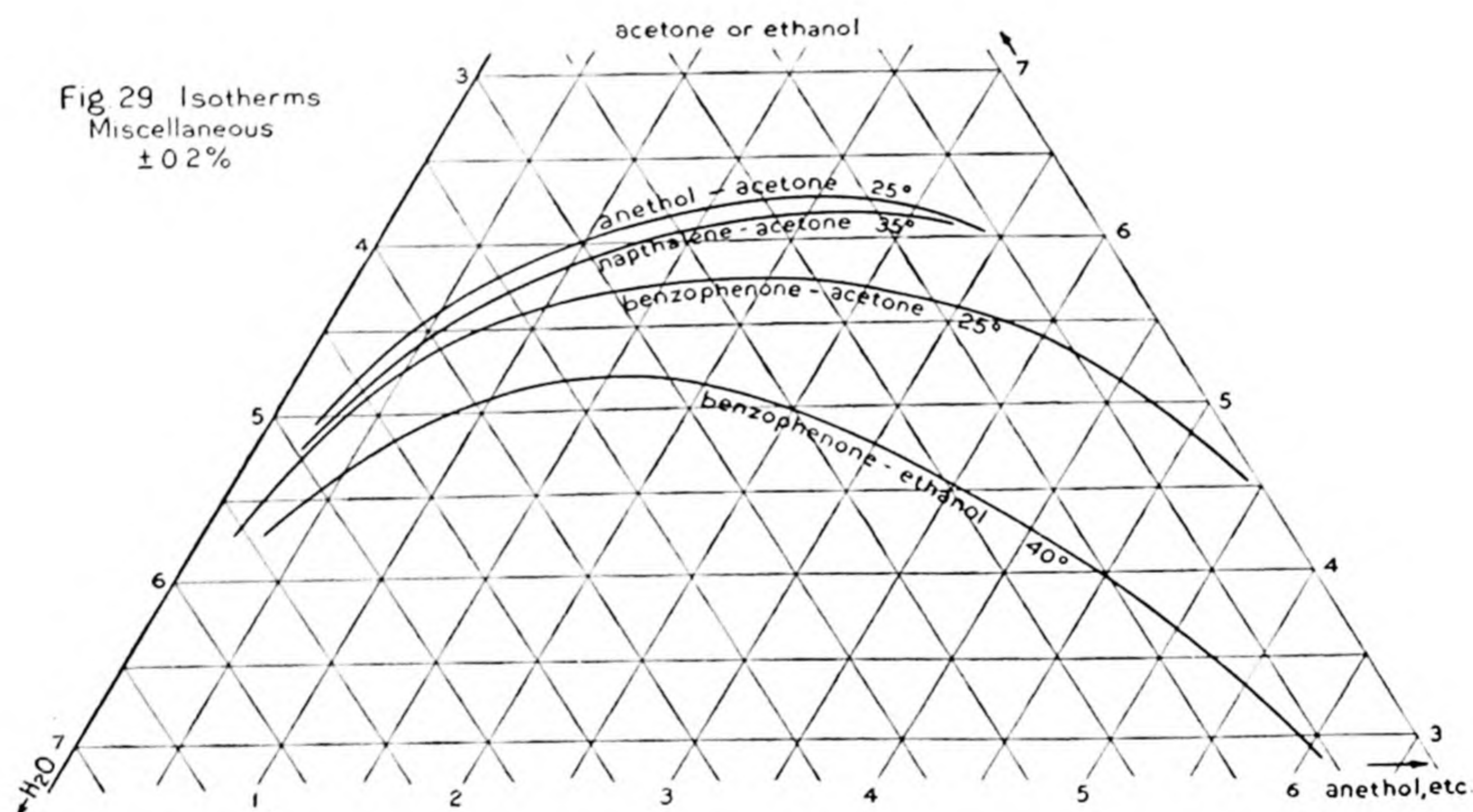
 $\pm 0.2\%$ 

TABLE 12.—(Continued)

% B	$t = 20^\circ\text{C}$			$t = 25^\circ\text{C}$	
	% C	% (C) _c ± 0.5	% C ₁	% (C ₁) _c	% C ₁
30	7.2	4.0	5.9	15.2	
40	4.7	6.0	2.9	19.0	
50	2.7	9.0	1.2†	23.2	
60	1.2†	12.0	0.5†		
70	0.5†	15.5			
96.4			0.0†	52.4	
98	0.0†	46.3			

TABLE 12.—(Continued)

% salt	% B		
	C, 20°	C ₁ , 20°	C ₁ , 25°
20	6.0	7.0	6.2
25	3.1	3.5	3.2
30	1.3	1.6†	1.4†
35	0.5		
45	0.3		
46.3	0.0		
52.4		Tr.	

* ± 0.3 . † ± 0.1 .

Plait-points, $t = 20^\circ\text{C}$: A = 57.5%; B = 37%; C = 5.5% $\pm 1\%$. A = 69.7%; B = 20.0%; C₁ = 10.3% $\pm 0.5\%$.

Temperature coefficients: $dC/dT = -0.06$ for 15% B; $dC/dT = -0.02$ for 30% B.

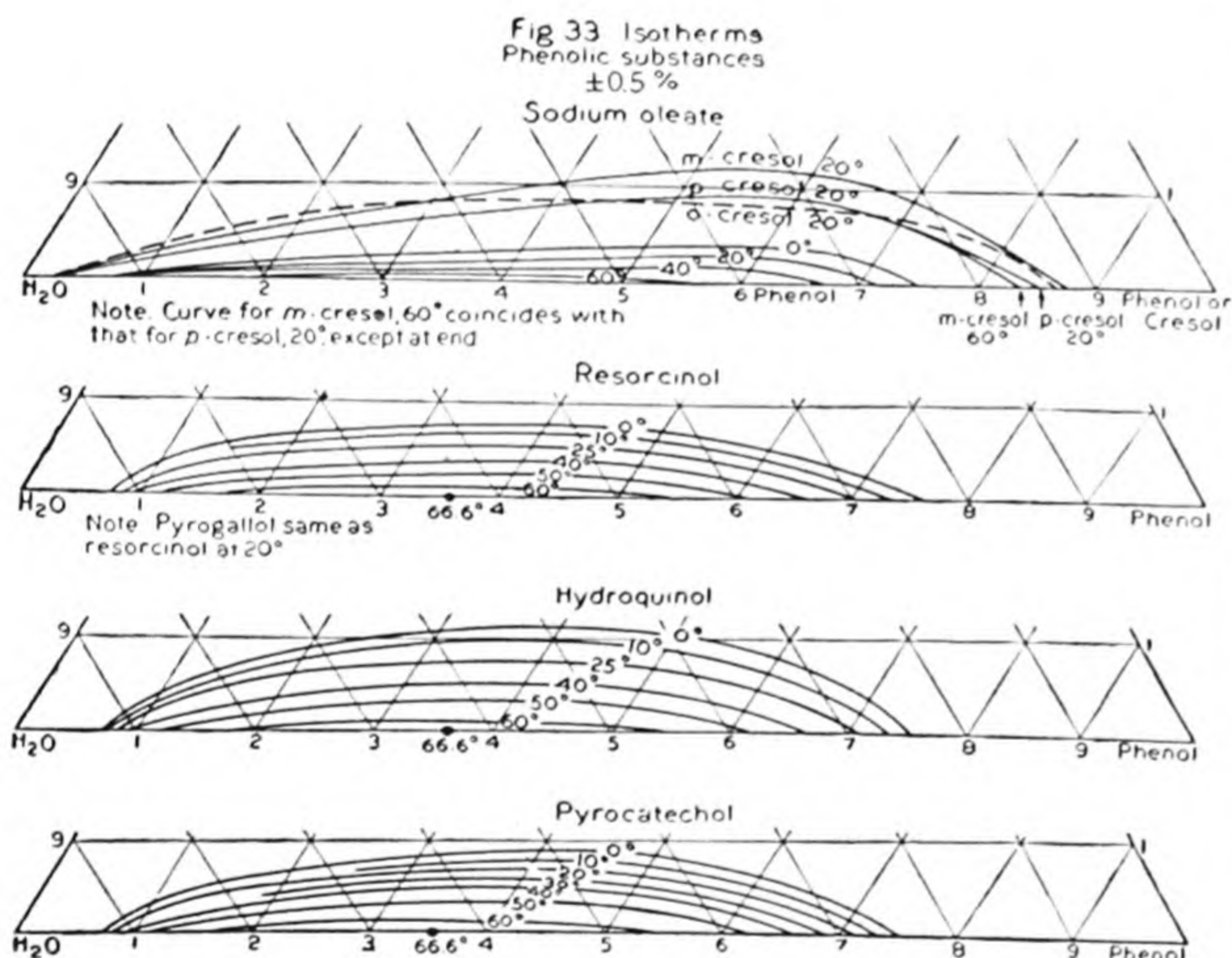
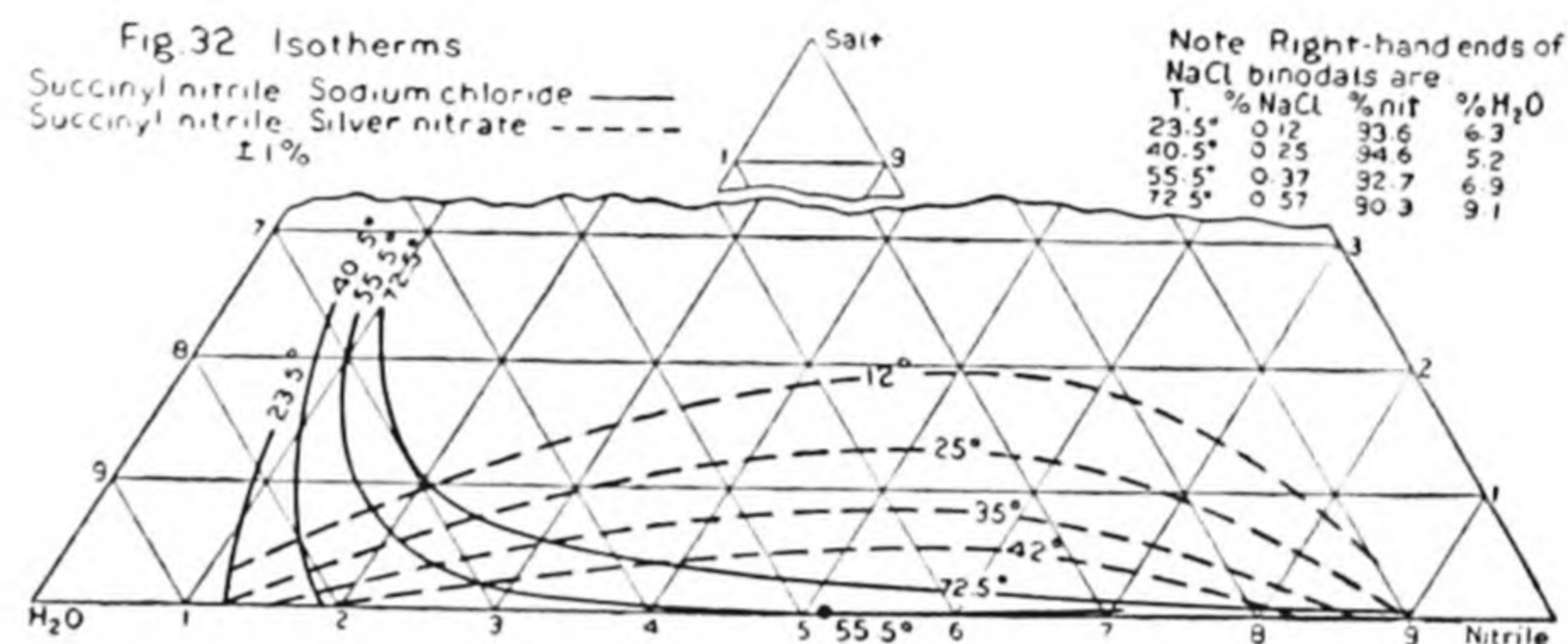
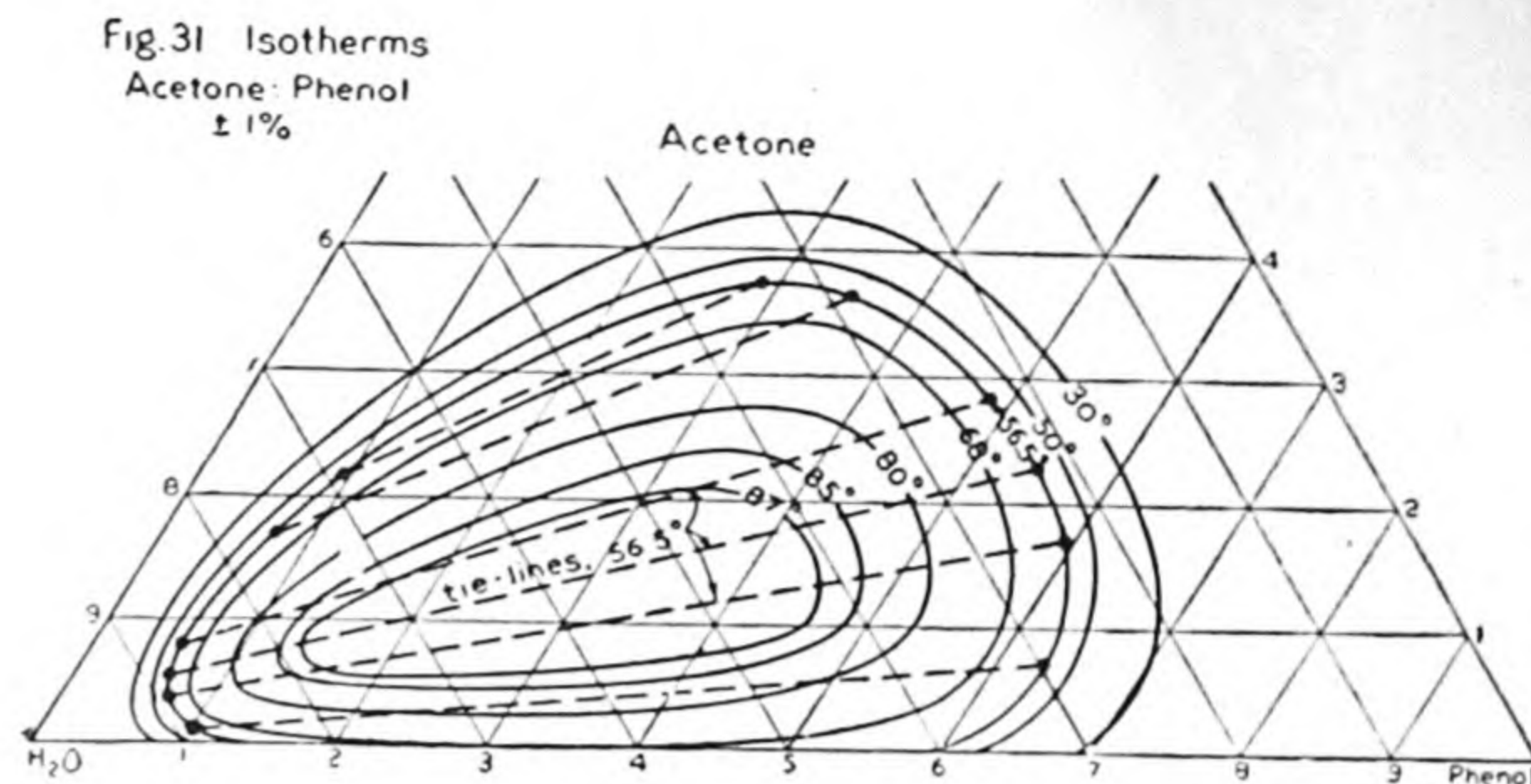
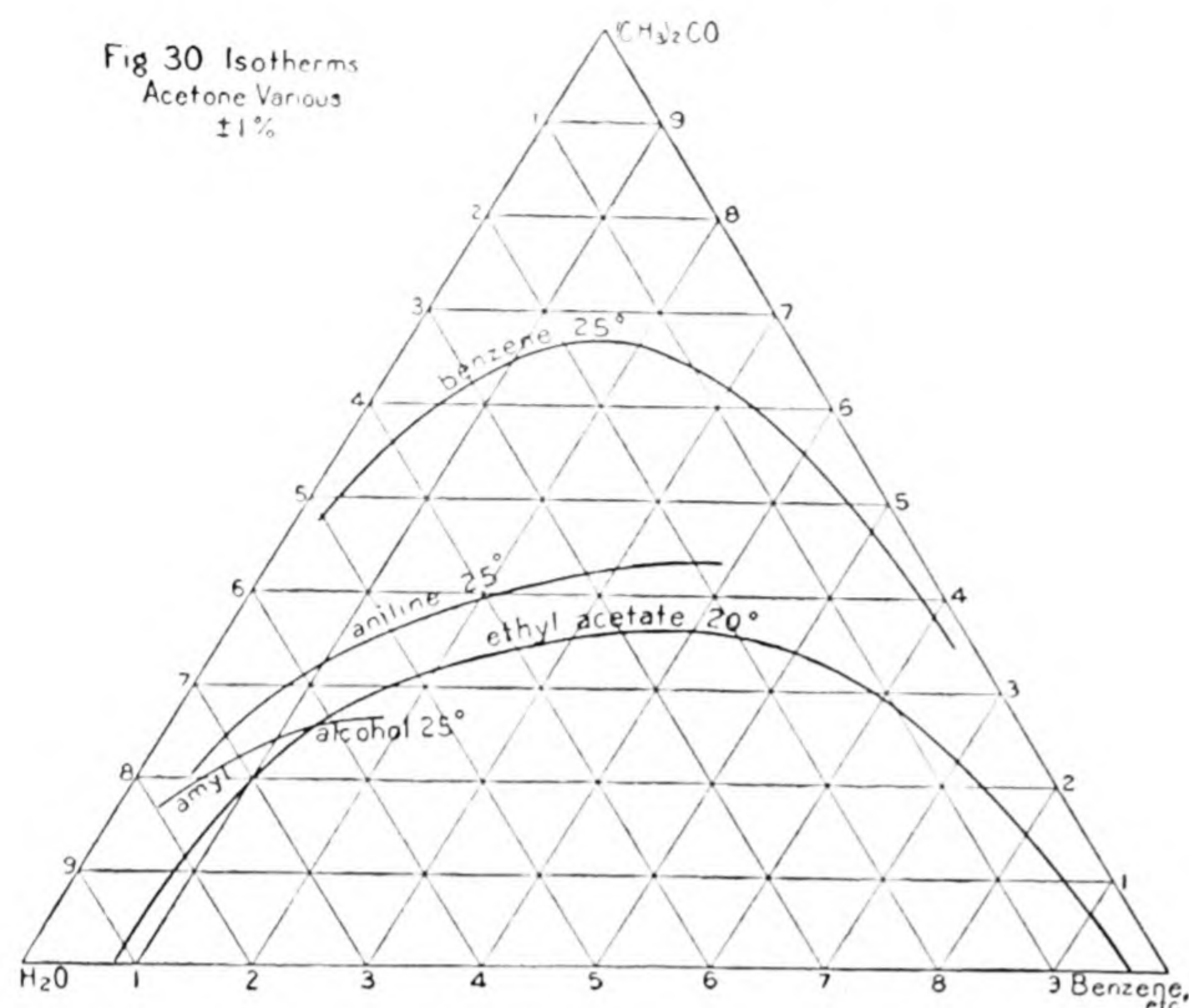


TABLE 13.—H₂O(A); C₃H₈O(B), *n*-PROPYL ALCOHOL; SALTS (C)
C = NaCl; C₁ = Na₂CO₃; probable error, 0.2% unless otherwise indicated

% B	% C, 25°	% C ₁ , 20°	% salt	% B	
				C, 25°	C ₁ , 20°
10	7.8*	6.7*	10	8.0*	6.3*
15	4.0	4.2*	15	5.2*	3.0†
20	3.5	3.0*	20	3.2	
30		2.0	25	2.2	
40		1.3			
50	2.3	0.7†			
60		0.3†			
70		0.2†			
80	0.8				

* ±0.3. † ±0.1. ‡ ±0.5.

TABLE 13.—(Continued)

Temperature coefficient; $dB/dT = -0.08$ for 9% C.
C = KF; C₁ = K₂CO₃; $t = 25^\circ\text{C}$; probable error, ±0.2% unless otherwise indicated; solutions marked (a), (a); (b), (b); (c), (c) are conjugate

% B	% C	% C ₁	% salt	% B	
				C	C ₁
10	5.7	6.7	10	5.7 (b)	6.8†
15	3.3	3.8	15	3.1	3.8
20	2.4	2.7	20	1.6	2.0
30	1.9	2.1*	25	1.0*	1.0*
40	1.6*	1.6*	30	0.5*	0.5*
50	1.1*	1.0*	40	0.2*	0.2*
60	0.8*	0.5*	47.6	0.04 (c)	
70	0.5*		53		0.02 (a)
80	0.3*(b)				
95.8		0.02 (a)			
96.8	0.2*(c)				

* ±0.1.

† ±0.3.

Temperature coefficient: $dB/dT = -0.02$ for C = 15%.

TABLE 14.—H₂O(A); C₃H₈O(B), ISOPROPYL ALCOHOL; SALTS (C)
C = KF; C₁ = K₂CO₃; $t = 20^\circ\text{C}$; error, ±0.2% unless otherwise indicated

% B	% C	% C ₁	% salt	% B	
				C	C ₁
10	15.5*	17.0†	20	5.0*	7.0
15	12.8*	13.7	25	2.5*	4.0
20	10.7*	12.0	30	1.5*	2.1
30	7.5†	9.0†			
40	6.0†	6.2			
50	4.5†	4.0			
60	4.0*				
80	1.8				

* ±0.5.

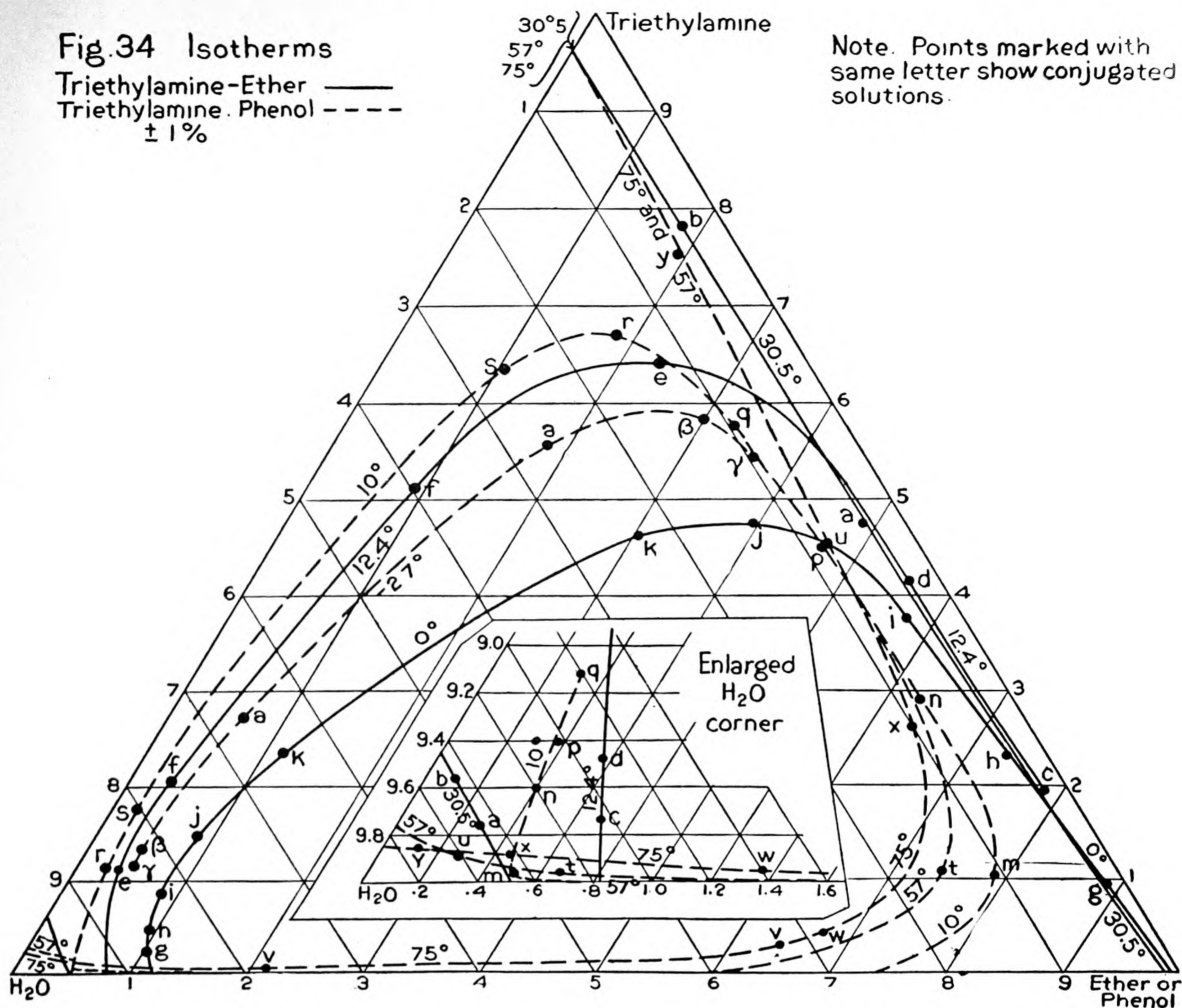
† ±1.0.

‡ ±0.3.

Fig.34 Isotherms

Triethylamine-Ether ———
 Triethylamine-Phenol - - - -
 $\pm 1\%$

Note. Points marked with same letter show conjugated solutions.

TABLE 15.—H₂O(A); C₄H₆O₄(B), SUCCINIC ACID; C₄H₁₀O(C), ETHYL ETHER

% B	% C		
	15°	20°	25°
0	7.80	6.87	6.00 ± 0.05
2	8.00	6.97	6.10 ± 0.05
4	8.11	7.07	6.20 ± 0.05
6		7.17	6.35 ± 0.05
8			6.50 ± 0.05

Mutually saturated solns. of A, B, and C in %, ± 0.05 .

Upper				Lower		
°C	A	B	C	A	B	C
15	1.40	1.29	97.31	86.10	5.68	8.22
20	1.53	1.47	97.00	85.67	7.10	7.23
25	1.66	1.69	96.35	84.68	8.76	6.56

Solubility of water in ether containing less than above amounts of acid is given by linear interpolation between above values and those for pure ether: (1.18 % at 15°; 1.24 % at 20°; 1.31 % at 25°).

TABLE 15.—(Continued)

Ratio of % acid in water layer to % acid in ether layer from about 1 % in water layer to saturation, is given, to ± 0.01 , by

$$\left. \begin{aligned} R &= 4.65 - 0.043a, \text{ at } 15^\circ \\ R &= 5.15 - 0.046a, \text{ at } 20^\circ \\ R &= 5.65 - 0.052a, \text{ at } 25^\circ \end{aligned} \right\} \text{ where } a = \% \text{ in water layer}$$

H₂O(A); C₄H₁₀O(B), Ethyl ether; Salts (C)

C = NaCl; C₁ = NaC₂H₃O₂; error, $\pm 0.2\%$ unless otherwise indicated

% salt	% B		
	C, 15°	C, 25°	C ₁ , 18°
0	7.8*	6.0*	7.2*
2	6.6*	5.1*	5.9*
4	5.5*	4.2*	4.7*
6	4.3*	3.4*	3.9*
8	3.5	2.6	3.2*
10	2.8	2.0	
15	1.5	1.1	
20	0.8	0.6	
25	0.3		

* ± 0.1 .

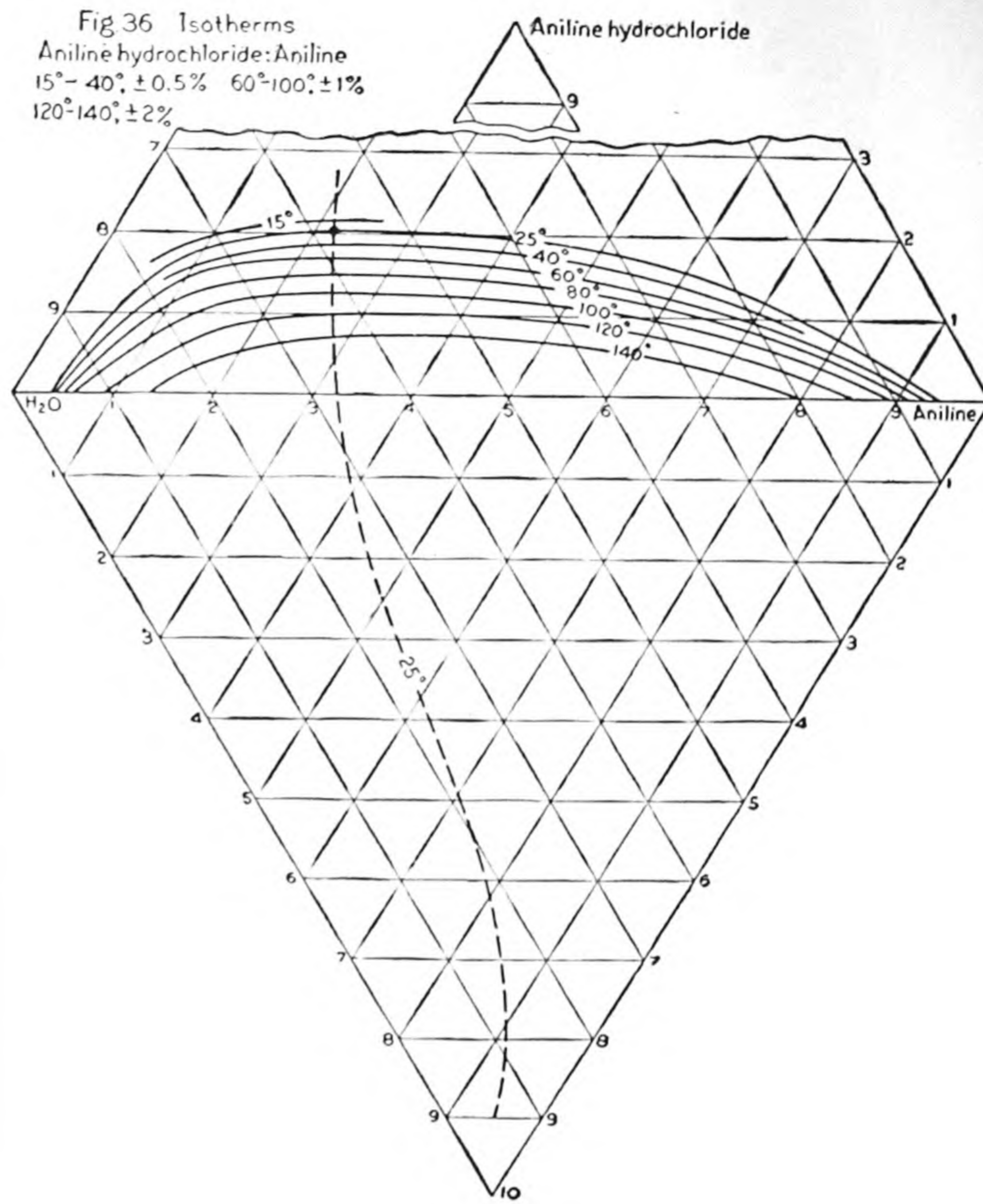
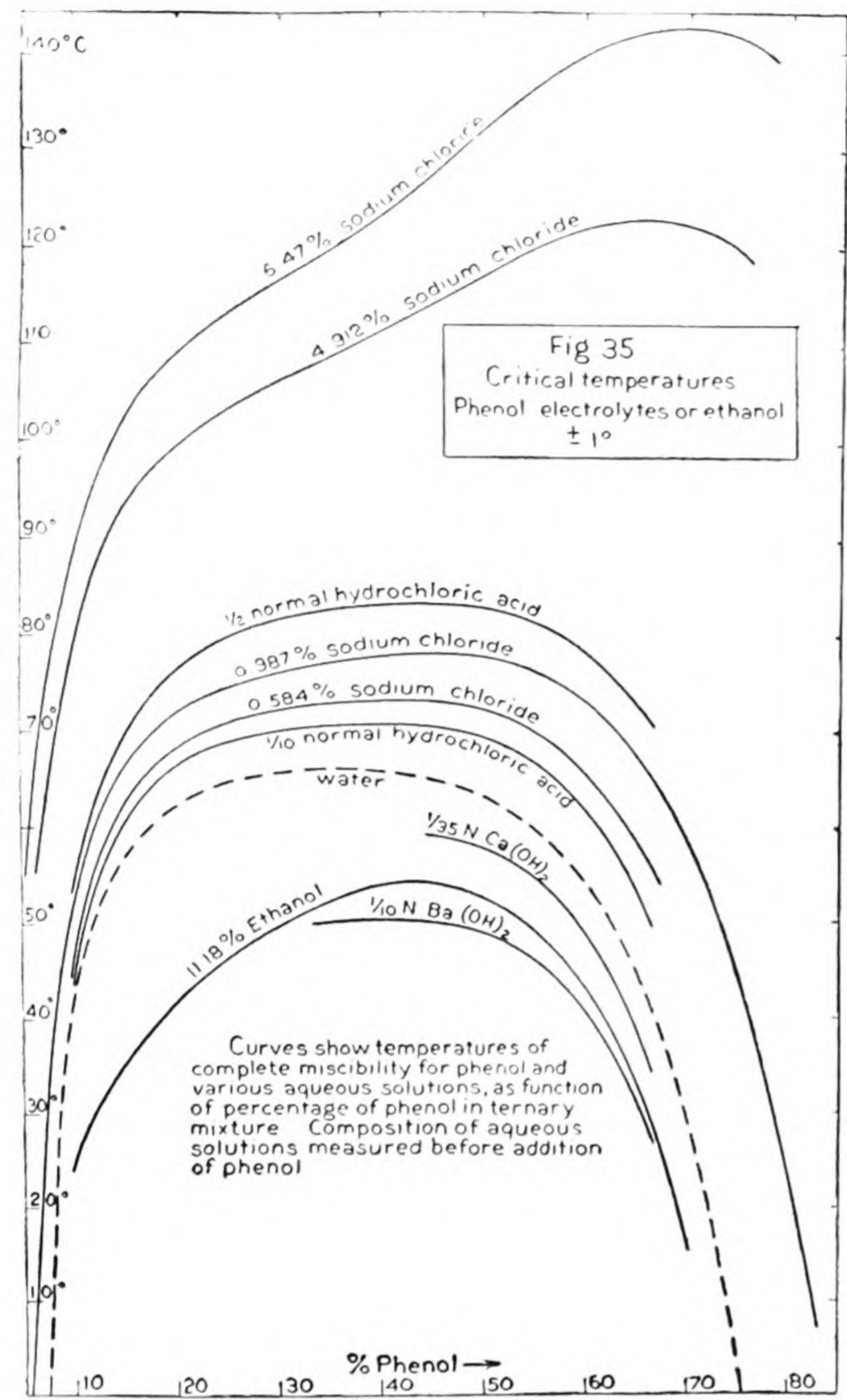


TABLE 16.—H₂O(A); C₄H₈O(B), METHYL ETHYL KETONE; SALTS (C)

C = NaCl; C ₁ = KF; t = 20°C			
% B	% C ± 0.5	% C	% B
10	7.5	10	8.0 ± 0.5
15	3.0	15	4.5 ± 1
20	0.7	20	2.5 ± 1
% B	% C ₁ ± 0.2	% C ₁	% B
10	5.5	10	5.1 ± 0.2
15	2.7	15	2.5 ± 0.2
20	1.0	20	1.0 ± 0.2
		25	0.4

TABLE 17.—H₂O(A); C₅H₁₂O(B), ISOAMYL ALCOHOL; * NaCl(C) Systems conjugated at 28°C

Upper		Lower	
% C	% B	% C	% A
0	2.3 ± 0.1	0	9.8 ± 0.1
5	1.65 ± 0.1		8.7 ± 0.1
10	1.05 ± 0.1		7.7 ± 0.1

TABLE 17.—(Continued)

Upper		Lower	
% C	% B	% C	% A
15	0.6 ± 0.1		6.7 ± 0.1
20	0.35 ± 0.05		5.7 ± 0.1
26.36	0.22 ± 0.05	0.05	4.5

* Isoamyl alcohol contained 16 % active isomer.

TABLE 18.—H₂O(A); C₆H₇N(B), ANILINE; ANILINE SALTS (C)
100 cm³ of aqueous solution of aniline hydrochloride or nitrate, containing given number of moles per l, dissolves tabulated weight of B at given temperature; values may be 0.5 g too high.

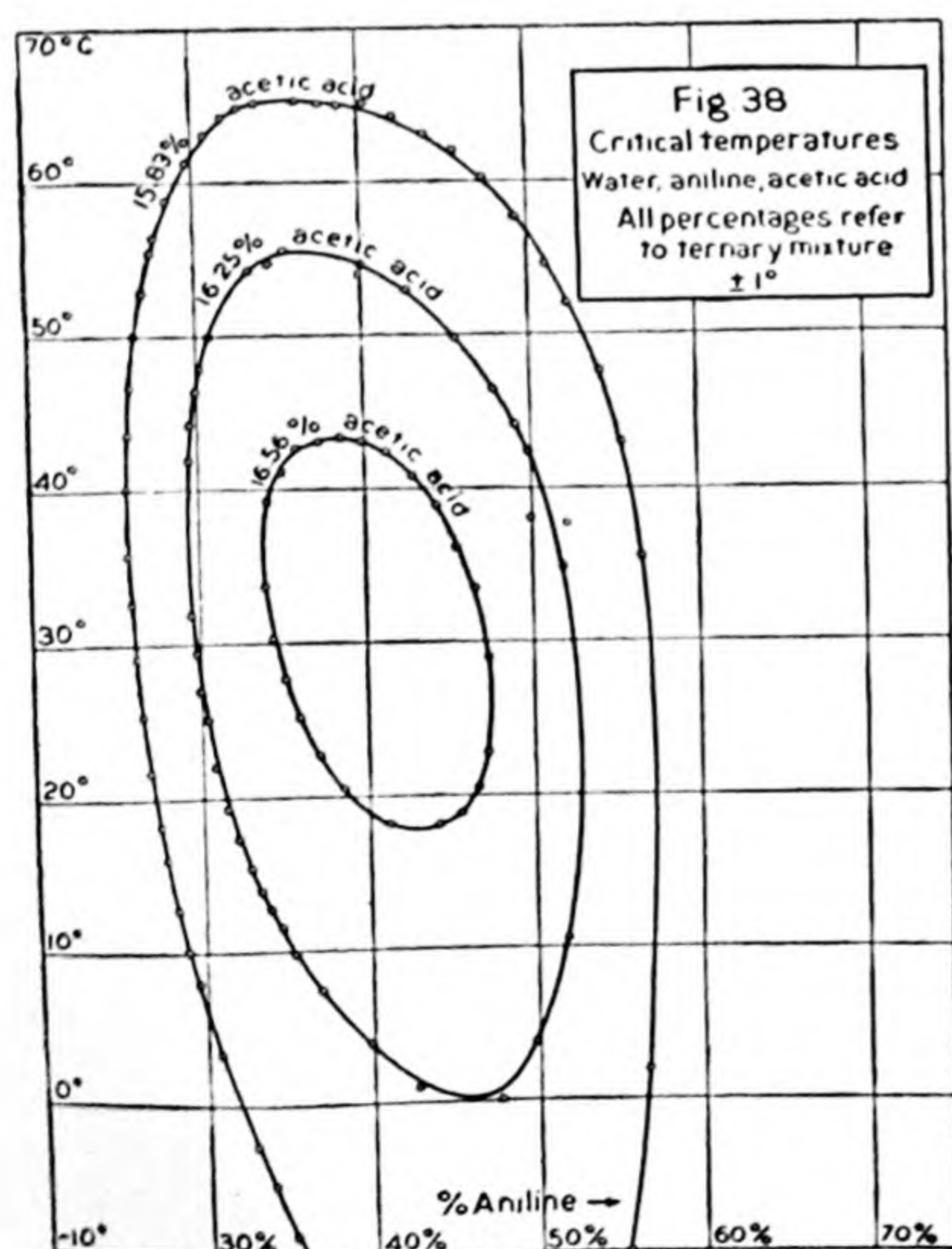
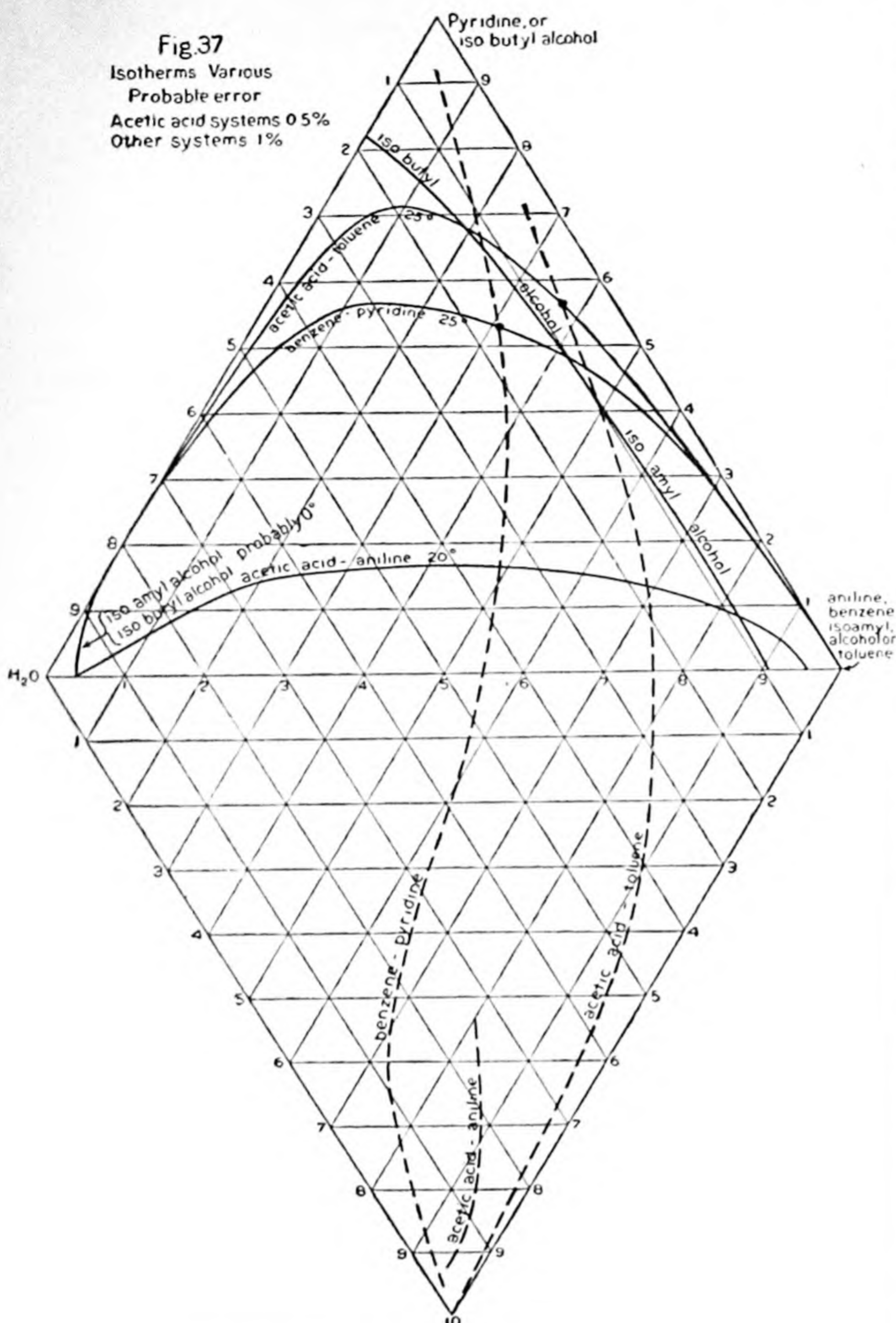
M _{salt} /l	0.5	0.75	1.00	1.25	1.50	2.00
g B, 18°C	4.6	4.9	5.3	5.9	8.0	20.5
g B, 24°C	4.9	5.3	5.7	6.4	8.7	

TABLE 19.—H₂O(A); C₆H₁₀O₃(B), ETHYL ACETOACETATE; SALTS (C)
t = 18°C; probable error, 0.2%

% NaCl	0	2	4	6
% B	11.1	9.2	8.0	7.3
% NaNO ₃	0	4	8	
% B	11.1	10.3	9.6	

LITERATURE

(For a key to the periodicals see end of volume)



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PHASE-EQUILIBRIUM DATA FOR CONDENSED SYSTEMS CONTAINING TWO LIQUID PHASES WITH A THIRD COMPONENT IN DISTRIBUTION EQUILIBRIUM BETWEEN THEM, THE TWO LIQUID PHASES BEING PRACTICALLY NON-MISCIBLE; DISTRIBUTION COEFFICIENTS

GEORGE SHANNON FORBES AND GAYLORD WEST ANDERSON

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Symbols, units and conventions.	Symboles, unités et conventions.	Zeichen, Einheiten und Festlegungen.	Simboli, unità e convenzioni	418
Aqueous systems.	Systèmes aqueux.	Systeme mit Wasser.	Sistemi acquosi.	
The distributed substance is an elementary substance or an inorganic compound.	La substance distribuée est une substance élémentaire ou un composé inorganique.	Der verteilte Stoff ist ein elementarer Stoff oder eine anorganische Verbindung.	La sostanza ripartita tra i due liquidi è un elemento o un composto inorganico.....	419
The distributed substance is an organic compound.	La substance distribuée est un composé organique.	Der verteilte Stoff ist eine organische Verbindung.	La sostanza ripartita è un composto organico.	422
The distributed component is a dyestuff or a material of unknown or indefinite composition.	Le constituant distribué est une teinture ou une matière de composition inconnue ou non définie.	Der verteilte Stoff ist ein Farbstoff oder ein Stoff unbekannter oder unbestimmter Zusammensetzung.	Il componente ripartito è una sostanza colorante, o un composto di composizione sconosciuta o non definita..	433
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SYMBOLS, UNITS AND CONVENTIONS	SYMBOLS, UNITÉS ET CONVENTIONS	ZEICHEN, EINHEITEN UND FESTLEGUNGEN	SIMBOLI, UNITÀ E CONVENZIONI	
$[A]_B$ (resp. $[A]_C$) Equilibrium concentration of the distributed component, A, in gram-formula-weights per liter of the solution (A + B), (resp. the solution (A + C)).	$[A]_B$ (resp. $[A]_C$) Concentration d'équilibre du constituant distribué, A, exprimée en mol. gr. par litre de solution (A + B), (resp. de solution (A + C)).	$[A]_B$ (bezw. $[A]_C$) Die Gleichgewichtskonzentration der verteilten Komponente A, in Grammformelgewicht pro Liter der Lösung (A + B) (bezw. der Lösung (A + C)).	$[A]_B$ (o $[A]_C$) Concentrazione di equilibrio del componente A ripartito, espressa in numero di grammiformula per litro di soluzione (A + B) (o soluzione (A + C)).	
M_A/l_B (resp. M_A/l_C) Gram-formula-weights of A per l of B (resp. C).	M_A/l_B (resp. M_A/l_C) Mol. gr. de A par litre de B (resp. C).	M_A/l_B (bezw. M_A/l_C) Grammformelgewicht von A pro Liter von B (bezw. C).	M_A/l_B (o M_A/l_C) Numero di grammiformula di A per l di B (o di C).	
g A/l _B Grams of A per l of solution (A + B).	g A/l _B Grammes de A par litre de solution (A + B).	g A/l _B Gramme von A pro Liter der Lösung von (A + B).	g A/l _B Grammi di A per l di soluzione (A + B).	
g A/l _C Grams of A per l of solution (A + C).	g A/l _C Grammes de A par litre de solution (A + C).	g A/l _C Gramme von A pro Liter der Lösung (A + C).	g A/l _C Grammi di A per l di soluzione (A + C).	
g A/kg B Grams of A per 1000 g of B.	g A/kg B Grammes de A par 1000 g de B.	g A/kg B Gramme von A auf 1000 g von B.	g A/kg B Grammi di A per 1000 g di B.	
K Distribution ratio at t , °C = $[A]_C/[A]_B$.	K Rapport de distribution à t , °C = $[A]_C/[A]_B$.	K Das Verteilungsverhältnis bei der Temperatur t , °C = $[A]_C/[A]_B$.	K Coefficiente di ripartizione a t , °C = $[A]_C/[A]_B$.	
K' Distribution ratio at t , °C = $1/K$.	K' Rapport de distribution à t , °C = $1/K$.	K' Das Verteilungsverhältnis bei der Temperatur t , °C = $1/K$.	K' Coefficiente di ripartizione a t , °C = $1/K$.	
The pressure is atmospheric throughout.	La pression est partout la pression atmosphérique.	Drucke immer ein Atmosphäre.	Si suppone sempre che la pressione è quella atmosferica.	
Where no limits are given under °C, the constancy of temperature is not known.	Lorsqu'aucunes limites ne sont données sous °C, la constance de la température n'est pas connue.	Wo keine Grenzüngaben unter °C sich vorfinden, ist die Konstanz der Temperatur unbekannt.	Quando non vengono indicati limiti sotto la notazione °C, significa che non si conosce se la temperatura era mantenuta costante o no.	

A-B TABLE

AQUEOUS SYSTEMS

The C-component is H₂O in all cases

The A-component (the distributed component) is an elementary substance or a compound whose key formula does not begin with 16; A-B-Table, standard arrangement. The B-components are compounds whose key formulae begin with 16 and are in the C-arrangement under the respective A-components. The D-component, where given, is a solute in the aqueous layer.

H₂O₂

B = CHCl₃, Chloroform (14, 173)
 B = CH₃I, Methyl iodide (173)
 B = C₄H₈O₂, Ethyl acetate (173); cf. (14); at 25°C, K = 4.0 ± 0.1 for [A]_B = 0.50–0.72
 B = C₄H₈O₂, Propyl formate (14, 173)
 B = C₄H₁₀O, Isobutyl alcohol (14, 173)
 B = C₄H₁₀O, Ethyl ether (173); cf. (91, 120)

t = 25°C

[A] _B	K ± 0.1
0.161	9.1
0.252	8.8
0.345	8.2

B = C₆H₁₂O, Amyl alcohol (20, 85, 106)

t = 0°C

[A] _B	K
0.0115–0.0281	6.88 ± 0.05
0.199–0.749	6.65 ± 0.1

t = 25°C

0.094–0.912	7.0 ± 0.1
-------------	-----------

B = C₆H₁₂O, Amyl alcohol (20, 85, 106)

D = Aqueous solutions of NaOH; Na₂B₄O₇; K₂B₂O₄

B = C₆H₅NO₂, Nitrobenzene (14, 173)

B = C₆H₆, Benzene (14, 173)

B = C₆H₆O, Phenol (173)

B = C₆H₇N, Aniline (173); at 25°C, K = 4.09 ± 0.05 for [A]_B = 0.062–0.114

B = C₇H₉N, *m*-Toluidine (173)
 B = C₇H₁₄O₂, Amyl acetate (14, 173); at 25°C, K = 13.1 ± 0.2 for [A]_B = 0.182–0.295

B = C₇H₁₄O₂, Ethyl isovalerate (14, 173)

SYSTÈMES AQUEUX

Le constituant C est H₂O dans tous les cas

Le constituant A (le constituant distribué) est une substance élémentaire ou un composé dont la formule clé ne commence pas par 16; Table A-B, arrangement type. Les constituants B sont des composés dont la formule clé commence par 16 et ils sont disposés suivant l'arrangement C sous les composés A respectifs. Le constituant D, représente, lorsqu'il est donné, un corps dissout dans la couche aqueuse.

B = C₇H₁₄O₂, Propyl butyrate (14, 173)

B = C₈H₈O, Acetophenone (14, 173)

B = C₈H₁₆O₂, Isoamyl propionate (14, 173)

B = C₈H₁₆O₂, Isobutyl butyrate (14, 173)

B = C₉H₇N, Quinoline (173)

Cl₂

B = CCl₄ (83)

t = 0°C

[A] _C	K*
0.050	0.195
.1	.141
.2	.117
.3	.0935
.6	.0775
.9	.0705

* Partial hydrolysis.

ClO₂

B = CCl₄ (15)

t = 0°C

[A] _C	K'
0.164	1.27 ± 0.02
0.046	1.21 ± 0.02
0.0016	1.17 ± 0.02

t = 25°C

0.121	1.69 ± 0.03
0.035	1.66 ± 0.03
0.0030	1.60 ± 0.03

B = CCl₄ (15)

D = Aqueous solutions of H₂SO₄; KCl; KClO₃

HCl

B = C₄H₁₀O, Ethyl ether (86); see p. 400

B = C₆H₆, Benzene (165.5, 170.5, 180)

Br₂

B = CCl₄ (81, 82, 84, 95, 122); cf. (72)

t = 0°C

[A] _B	K' ± 0.05*
0.1	20.85
0.5	22.05
1.0	23.52

SYSTEME MIT WASSER

In allen Fällen ist H₂O die C-Komponente

Die A-Komponente (die verteilte Komponente) ist ein elementarer Stoff oder eine Verbindung dessen Schlüssel-formel nicht mit 16 beginnt; A-B-Tafel, Standardanordnung. Die B-Komponente ist eine Verbindung deren Schlüssel-formel mit 16 beginnt, sie steht unter der entsprechenden A-Komponente in der C-Anordnung. Eine D-Komponente ist, wenn angegeben, ein gelöster Stoff in der wässrigen Schichte.

B = CCl₄; t = 0°C.—

(Continued)

[A] _B	K' ± 0.05*
1.5	25.00
2.0	26.45

t = 25°C

[A] _B	K' ± 0.2†
0.04	26.8
0.1	27.2
0.5	29.0
1.0	30.4
1.5	31.9
2.0	33.4
2.5	35.0
3.0	36.5
3.5	38.1

t = 40°C

[A] _B	K' ± 2†
0.1	30
0.5	31

* No hydrolysis.

† Partial hydrolysis. At 25°C M_A/kg C ÷ mole fraction of A in B at infinite dilution = 0.371 ± 0.001.

B = CCl₄ (68, 75, 82, 95, 169)

D = Aqueous solutions of HBr; HgBr₂; HgBr₂ + KBr; CdBr₂; CdBr₂ + KBr; CaBr₂; BaBr₂; Na₂SO₄; NaNO₃; KCl; K₂SO₄

B = CCl₄ + CS₂ (mixtures) (67, 72)

B = CS₂ (72, 81); cf. (8)

t = 25°C

[A] _B	K' ± 2*
0.25	78
0.50	79
1.0	80
1.5	81
2.0	82

* Partial hydrolysis.

B = CS₂ (82, 136)

D = Aqueous solution of KBr

t = 25°C

[A] _B	K ± 0.005*
0.005	0.0696
0.02	0.0651
0.03	0.0621

SISTEMI ACQUOSI

Il componente C è sempre l'acqua

Il componente A (cioè componente distribuito tra i due liquidi) è un elemento, o un composto di cui la formula chiave non comincia con 16; Tabella A-B dell'ordinamento standard. I componenti B sono composti di cui le formule chiavi cominciano con 16; essi si trovano nell'ordinamento C sotto i rispettivi componenti A. Il componente D, dove è indicato, è una sostanza disciolta nello strato acquoso.

B = CS₂; D = KBr

t = 25°C.—(Continued)

KBr = 1/8 M

[A] _B	K ± 0.001*
0.005	0.1055
0.02	0.099
0.03	0.094
0.04	0.090
0.05	0.086

KBr = 1/4 M

[A] _B	K ± 0.001*
0.005	0.1735
0.02	0.167
0.03	0.163
0.04	0.159
0.05	0.155
0.06	0.151

KBr = 1/2 M

[A] _B	K ± 0.002*
0.02	0.303
0.03	0.298
0.04	0.293
0.05	0.288
0.06	0.283
0.095	0.271

* Partial hydrolysis.

B = CHBr₃, Bromoform (81)

t = 25°C

[A] _B	K' ± 0.2*
0.125	64.7
0.25	65.5
0.5	66.7
0.75	67.6
1.0	68.2
1.5	68.7
2.0	68.8
2.5	68.9

* Partial hydrolysis.

B = C₂HCl₅, Pentachloroethane (76)

B = C₂H₂Cl₄, Tetrachloroethane (76)

I_2
B = CCl_4 (31, 32, 81, 99, 175)

$t = 25^\circ C$

$[A]_B$	$K' \pm 0.5^*$
0.02	85.1
0.04	85.2
0.06	85.4
0.08	86.0
0.09	86.4
0.10	87.5

* $K' \pm 0.5 = 82.8$ for $[A]_B = 0.034 - 0.044$ at $18 \pm 0.02^\circ C$; = 56.7 for g A/kg B = 0.023 - 0.051 at $25^\circ C$.

B = CCl_4 (31, 68, 75, 101, 169)

D = Aqueous solutions of $HgCl_2$; $HgBr_2$; $HgI_2 + KI$; CaI_2 ; BaI_2 ; SrI_2 ; $KI + starch$; $K_2C_2O_4$

B = CCl_4 (32)

D = Aqueous solution of KI ; at $18 \pm 0.02^\circ C$, $K' = 0.00115 \pm 0.00001$ for $[A]_B = 0.03$

B = $CCl_4 + C_7H_8$ (mixtures) (29)

D = Aqueous solution of KI

B = CS_2 (29, 31, 37, 81); cf. (8)

$t = 25^\circ C$

$[A]_B$	$K' \pm 5^*$
0.1	586
0.2	590
0.3	601
0.4	614
0.5	629
0.6	646

* Partial hydrolysis.

B = CS_2 (82, 119, 169)

D = Aqueous solutions of ZnI_2 ; $ZnI_2 + KI$; $CdI_2 + KI$; NiI_2 ; LaI_3 ; SrI_2 ; Na_2SO_4 ; $NaNO_3$; C_2H_5OH

B = CS_2 (82); cf. (27)

D = Aqueous solution of KI

$t = 25^\circ C$

$KI = \frac{1}{32}M$

$[A]_B$	$K \pm 0.0003^*$
0.1	0.0364
0.2	0.0323
0.3	0.0290
0.4	0.0264
0.5	0.0242
0.6	0.0224

$KI = \frac{1}{16}M$

$[A]_B$	$K \pm 0.0005^*$
0.05	0.0750
0.1	0.0703
0.2	0.0626
0.3	0.0564
0.4	0.0513
0.5	0.0472
0.6	0.0437

B = CS_2 ; D = KI
 $t = 25^\circ C$.—(Continued)

$KI = \frac{1}{8}M$

$[A]_B$	$K \pm 0.001^*$
0.02	0.153
0.05	0.148
0.1	0.139
0.2	0.124
0.3	0.112
0.4	0.102
0.5	0.094
0.6	0.087
0.7	0.080

$KI = \frac{1}{4}M$

$[A]_B$	$K \pm 0.002^*$
0.02	0.300
0.05	0.291
0.1	0.276
0.2	0.249

* Partial hydrolysis.

B = $CS_2 + CCl_4$ (mixtures) (67, 71)

B = $CS_2 + CCl_4$ (mixtures) (29, 67, 72)

D = Aqueous solutions of BaI_2 ; KI

B = $CS_2 + CHCl_3$ (mixtures) (29)

D = Aqueous solution of KI

B = $CS_2 + C_6H_6$ (mixtures) (29)

D = Aqueous solution of KI

B = $CS_2 + C_7H_8$ (mixtures) (29)

D = Aqueous solution of KI

B = $CS_2 + \text{Petroleum ether}$, B. P., $83-85^\circ$ (mixtures) (29)

D = Aqueous solution of KI

B = $CHBr_3$, Bromoform (81)
 $t = 25^\circ C$

g A/lB	$K' \pm 5^*$
30	434
60	467
90	493
120	510
150	532

* Partial hydrolysis.

B = $CHCl_3$, Chloroform

D = $C_3H_5O_3$, Glycerol + H_2O (mixtures) (63, 67, 72)

B = $CHCl_3$, Chloroform (72); at $25^\circ C$, $K' = 131 \pm 2$ for $[A]_B = 0.02-0.17$, with partial hydrolysis

B = $CHCl_3 + C_6H_6$ (mixtures) (29)

D = Aqueous solution of KI

B = C_2Cl_4 , Tetrachloroethylene (76)

B = C_2HCl_3 , Trichloroethylene (76)

B = C_2HCl_5 , Pentachloroethane (76)

B = $C_2H_2Cl_4$, Tetrachloroethane (76)

B = $C_4H_8O_2$, Ethyl acetate (35)

D = Aqueous solution of KI

B = $C_5H_{12}O$, Amyl alcohol (69); at $25^\circ C$, $K' = 230 \pm 20$ for $[A]_B = 0.00127 - 0.00278$, with partial hydrolysis

B = $C_5H_{12}O$, Amyl alcohol (69)

D = Aqueous solution of KI

B = $C_6H_5NO_2$, Nitrobenzene (32); at $18 \pm 0.02^\circ C$, $K' = 173 \pm 3$ for $[A]_B = 0.033 - 0.333$

B = $C_6H_5NO_2$, Nitrobenzene (33)

D = Aqueous solution of KI

B = $C_6H_6 + C_7H_8$ (mixtures) (29)

D = Aqueous solution of KI

B = $C_6H_6 + \text{Petroleum ether}$, B. P., $83-85^\circ$ (mixtures) (29)

D = Aqueous solution of KI

B = $C_{10}H_{12}$, Tetralin (77)

$t = 25^\circ C$

$[A]_B$	$K' \pm 10$
0.1	370
0.2	347
0.3	335
0.4	325

B = $C_{10}H_{18}$, Decahydronaphthalene (77)

$t = 25^\circ C$

$[A]_B$	$K' \pm 0.5$
0.03	67.0
0.04	62.2
0.05	59.6

SO_2

B = $CHCl_3$, Chloroform (42, 96, 102)

$t = 0^\circ C^*$

$[A]_B$	$K \pm 0.05$
0.05	1.42
0.1	1.12
0.2	1.05
0.4	1.00
0.7	0.98

$t = 20^\circ C$

$[A]_B$	$K \pm 0.05$
0.05	1.39
0.1	1.20
0.2	1.06
0.4	0.98
0.7	0.94
1.1	0.92

* At $0^\circ C$, $K = 5.7 \pm 0.2$ for $[A]_B = 0.000932$.

B = C_6H_6 , Benzene (46)

D = Aqueous solutions of $NaOH$; KOH

H_2S

B = C_6H_6 , Benzene (56); at $25^\circ C$, $K = 0.167 \pm 0.005$ for $[A]_B = 0.072-0.108$

$H_2S + HCN$ (mixtures)

B = C_6H_6 , Benzene (56)

H_2SO_4

B = $C_5H_{12}O$, Amyl alcohol (117)

$t = 25^\circ C$

$[A]_B$	$K' \pm 0.0001$
0.0001	0.0052
0.0003	0.0062
0.0006	0.0072
0.0012	0.0084
0.0017	0.00915

$TeCl_4$

B = $C_4H_{10}O$, Ethyl ether (113)

N_2O_3

B = $CHCl_3$, Chloroform (142)

$t = 0^\circ C$

$[A]_B$	$K \pm 0.1$
0.0265	0.9
0.0125	1.0
0.0055	1.3

NH_3

B = CCl_4 (74, 155, 158)

$t = 25^\circ C$

$[A]_B$	$K' \pm 0.0001$
0.01	0.0047
0.03	0.0059
0.05	0.00715
0.07	0.00835

B = $CHBr_3$, Bromoform (74, 155, 158)

$t = 25^\circ C$

$[A]_B$	$K' \pm 0.001$
0.05	0.026
0.2	0.035
0.3	0.041
0.4	0.047

B = $CHCl_3$, Chloroform (1, 7, 30, 36, 37, 62, 109, 148, 155)

$t = 25^\circ C$

$[A]_B$	$K \pm 0.2^*$
0.01	24.5
0.05	23.1
0.1	21.8
0.2	19.7
0.4	16.6
0.6	14.2
0.8	12.40
1.0	11.10
1.2	10.15

* At $2^\circ C$, $K = 38.5 \pm 1$ for $[A]_B/lB$ cf. = 0.017; at $18^\circ C$, $K = 28.0 \pm 0.5$ for $[A]_B = 0.0015$.

K from $15-35^\circ C$ for solns. ca. 0.01 molal is given by the equation: $K_t = 28.2 - 0.37(t - 15)$.

B = $CHCl_3$ (1, 30, 36, 37, 38, 62, 148)

D = Aqueous solutions of various salts

B = $CHCl_3 + C_5H_{12}O$, Amyl alcohol (mixtures) (67, 71)

B = $C_4H_{10}O$, Ethyl ether (100); cf. (8)

B = C₄H₁₀O.—(Continued)

t = 20°C

[A] _C	K ± 2
0.01	160
0.005	204

B = C₅H₁₂O, Amyl alcohol (69); cf. (158); at 20°C, K' = 0.145 ± 0.005 for [A]_B = 0.0122–0.455

N₂H₄, Hydrazine

B = C₆H₆, Benzene (58); from 13–15°C, K = 75 ± 5 for [A]_B = 0.011–0.057

HNO₃

B = C₄H₁₀O, Ethyl ether (12, 13, 86, 149); cf. (165)

t = 25°C

[A] _B	K
0.0005	80 ± 2
0.001	66 ± 2
0.002	53 ± 1
0.005	35 ± 1
0.01	28.5 ± 0.5
0.03	17.0 ± 0.5
0.05	13.5 ± 0.2
0.07	11.6 ± 0.2
0.09	11.0 ± 0.2

B = C₄H₁₀O, Ethyl ether (165)
D = Aqueous solutions of various nitrates alone and with the addition of HCl, H₂SO₄ and H₃PO₄

SbCl₃

B = C₄H₁₀O, Ethyl ether (113)
D = HCl

AsCl₃

B = C₄H₁₀O, Ethyl ether (113)
D = HCl

As₂O₃

B = C₅H₁₂O, Amyl alcohol (4); at 25°C, K = 5.49 ± 0.05 for [A]_B = 0.0083–0.0324

B = C₅H₁₂O, Amyl alcohol (4)
D = Aqueous solution of H₃BO₃

As₂S₃ (colloidal) (22)B = C₄H₁₀O, Ethyl ether

For HCN and other compounds of carbon, see p. 422.

SnCl₄

B = C₄H₁₀O, Ethyl ether (113)
D = HCl

B = C₈H₁₀, Xylene (153, 154)

°C	Wt. % Cl in	K
(A.5H ₂ O + B)		
66	0.08	504 ± 10
80	0.17	228 ± 10
97.5	0.33	122 ± 5
111	0.68	59 ± 5
(A.4H ₂ O + B)		
66	0.92	45 ± 2

B = C₈H₁₀.—(Continued)

°C	Wt. % Cl in	K
(A.4H ₂ O + B).—(Continued)		
80	1.55	27 ± 2
100	2.51	17 ± 1
111	3.23	13 ± 1

(A.3H₂O + B)

80	9.95	4.3 ± 0.1
94	9.32	4.6 ± 0.1
100	10.56	4.1 ± 0.1
111	10.03	4.2 ± 0.1

GaCl₃

B = C₄H₁₀O, Ethyl ether (160.5)
D = HCl

t = 20.0°C

M _D /l	K'
2.0	0.035 ± 0.003
3.0	0.21 ± 0.01
4.0	8.5 ± 0.1
5.0	57 ± 2
5.45	75 ± 3
6.0	42 ± 2
7.0	10.0 ± 0.3
8.0	2.0 ± 0.1

* 100 mg Ga as GaCl₃ in 50 cm³ HCl of varying concentration and 50 cm³ ether.

ZnCl₂

B = C₄H₁₀O, Ethyl ether
D = HCl (113)

CdCl₂B = C₅H₁₂O, Amyl alcohol (74)CdI₂B = C₄H₁₀O, Ethyl ether (39)

t = 30°C

[A] _B	K ± 0.1
0.01	6.1
0.02	5.8
0.05	5.3
0.10	4.9
0.15	4.65*
0.20	4.49*

* ± 0.05.

B = C₅H₁₂O, Amyl alcohol (39, 74)

t = 25°C

[A] _B	K ± 0.05
0.03	1.36
0.05	1.21
0.1	1.09
0.2	1.03
0.5	1.05*
1.0	1.2*
1.5	1.3*

t = 30°C

[A] _B	K ± 0.02
0.03	1.70
0.05	1.53
0.1	1.39
0.2	1.24†
0.5	1.13†
1.0	1.11†

* ± 0.1.

† ± 0.01.

HgCl₂B = CHCl₃, Chloroform (62)

B = C₄H₁₀O, Ethyl ether (62, 159, 160); cf. (113, 152); from 0–25°C, K = 0.42 ± 0.02 for [A]_B/l_B = 0.01–0.02; 0–17°C, K = 0.30 ± 0.05 for [A]_B = 0.3–0.5

B = C₄H₁₀O, Ethyl ether (113)
D = HCl

B = C₆H₆, Benzene (97); cf. (62)
t = 25°C

[A] _B	K ± 0.05
0.001	11.97
0.005	12.31
0.010	12.73
0.015	13.16
0.020	13.58
0.025	14.01

t = 40°C

0.001	10.82
0.005	11.16
0.010	11.61
0.015	12.05
0.020	12.49
0.025	13.03

B = C₆H₆ (98, 147)

D = Aqueous solutions of NaCl; KCl

B = C₇H₈, Toluene (43, 63, 111); cf. (16, 62, 97)

t = 25°C

[A] _B	K ± 0.2*
0.001	10.8
0.005	11.2
0.01	11.4
0.02	11.5
0.31	12.7

* From 0–50°C, K = 11.6 ± 0.3 for [A]_B = 0.005.

B = C₇H₈, Toluene (43, 111)

D = Aqueous solutions of ZnCl₂; Hg(NO₃)₂

B = C₁₀H₁₂, Tetralin (77)HgBr₂

B = C₆H₆, Benzene (147); at 25°C, K = 0.89 ± 0.01 for [A]_B = 0.0035–0.194

B = C₆H₆, Benzene (147)

D = Aqueous solution of KBr

HgI₂B = C₆H₆, Benzene (147)

D = Aqueous solution of KI

Hg(CN)₂B = C₄H₁₀O, Ethyl ether (147)

D = Aqueous solution of KCN

CuCl₂B = C₄H₁₀O, Ethyl ether (113)

D = HCl

AgClO₄

B = C₆H₆, Benzene (78); at 25°C, K = 46000 ± 5000 for [A]_B = <0.0000506

AgNO₃B = C₆H₇N, Aniline (54.5)

t = 16 ± 1°C

[A] _B	K'
0.05	71 ± 5
0.10	90 ± 3
0.20	106 ± 2
0.90	173 ± 2

HAuCl₄

B = C₄H₁₀O, Ethyl ether (113); 40 Wt. % of A in C removed by single extraction with B

B = C₄H₁₀O, Ethyl ether (113)
D = HCl; 98 Wt. % of A removed by single extraction from 10% D

IrCl₄B = C₄H₁₀O, Ethyl ether (113)

B = C₄H₁₀O, Ethyl ether (113)
D = HCl

PtCl₄B = C₄H₁₀O, Ethyl ether (113)

B = C₄H₁₀O, Ethyl ether (113)
D = HCl

PdCl₂B = C₄H₁₀O, Ethyl ether (113)

B = C₄H₁₀O, Ethyl ether (113)
D = HCl

FeCl₃B = C₄H₁₀O, Ethyl ether (113)

D = HCl

Fe(CNS)₃ (63); cf. (62)B = C₄H₁₀O, Ethyl ether

°C	[A] _B	K
0	0.0167	0.53*
10	0.0128	0.99*
20	0.0091	1.8†
25	0.00025	13.9‡
	0.001	6.9§
	0.002	4.8||
	0.005	2.7||
	0.01	1.8||
30	0.0059	3.3¶
35	0.0048	4.3§

* ± 0.05.

† ± 0.2.

‡ ± 1.0.

§ ± 0.5.

|| ± 0.1.

¶ ± 0.3.

B = C₄H₁₀O, Ethyl ether (63)D = HNO₃NiCl₂B = C₄H₁₀O, Ethyl ether (113)

D = HCl

Cr(CNS)₃B = C₄H₁₀O, Ethyl ether (63)

°C	[A] _B	K
0	0.0092	0.77*
8	0.0085	0.91*
20	0.0072	1.24†
30	0.0059	1.72†

* ± 0.02.

† ± 0.05.

Cr(CNS)₃·3H₂O, Chromitrihydrotrithiocyanate

B = C₄H₁₀O, Ethyl ether (10)

Cr(CNS)₄·2H₂O, Chromidihydrotetrahydrotrithiocyanate

B = C₄H₁₀O, Ethyl ether (10)

Cr(CNS)₅·H₂O, Chromihydro-pentathiothiocyanate

B = C₄H₁₀O, Ethyl ether (10)

H₃BO₃

B = CS₂ + C₅H₁₂O, Amyl alcohol (mixtures) (67, 72)

B = C₅H₁₂O, Amyl alcohol (112); cf. (2); at 15°C, K = 3.37 ± 0.02 for [A]_B = 0.085 - 0.264; at 25°C, K = 3.34 ± 0.05 for [A]_B = 0.008 - 0.086; at 35°C, K = 3.31 ± 0.05 for [A]_B = 0.044

B = C₅H₁₂O, Amyl alcohol (2)
D = Aqueous solution of KF

AlBr₃

B = C₆H₆, Benzene (105.5)

B = C₇H₈, Toluene (105.5)

LiCl

B = C₅H₁₂O, Amyl alcohol (39, 41)

t = 25-30°C

[A] _B	K
0.003	216 ± 5
0.01	162 ± 5
0.02	119 ± 3
0.03	98 ± 3
0.05	67 ± 2
0.1	45 ± 2
0.2	28.5 ± 1
0.3	20.5 ± 1
0.5	13.5 ± 1
1.0	9.0 ± 0.5
1.5	7.5 ± 0.5

B = C₅H₁₂O.—(Continued)

t = 24.90°C (20.5)

[A] _B	10 ³ K'
0.00015	3.0 ± 0.05
0.00030	3.1 ± 0.05
0.00045	3.2 ± 0.1
0.00060	3.3 ± 0.1

NaOH

B = C₄H₁₀O, Isobutyl alcohol (177)

t = 25°C

[OH ⁻] _C	K' ± 0.053
0.000076	0.000019
0.000152	0.000025

NaCl

B = C₄H₁₀O, Ethyl ether (88)

D = Aqueous solution of acetic acid

NaC₂H₃O₂

B = C₄H₁₀O (88)

D = Aqueous solution of acetic acid

NaC₇H₅O₃, Salicylate

B = Olive oil (64); at 15°R, K' = 0.1 ± ? for g A/l_B = 1.56

KOH

B = C₄H₁₀O, Isobutyl alcohol (177); at 25°C and [OH⁻]_C = 0.000146, K' = 0.0438 ± 0.05

KI

B = C₆H₅NO₂, Nitrobenzene (32); at 25°C, K = 5450 ± 100 for [A]_B = 0.00111

B = C₆H₆O, Phenol (134); at 18°C, K = 13 ± 1 for g A/100 cm³ = 0.52-2.09

K₂CO(CNS)₄

B = C₂H₆O, Ethyl alcohol (3.1)

⌘-TABLE

The A-components (the distributed substances) are compounds whose key formulae begin with 16; the ⌘-arrangement. Under each A-component the B-components are likewise in the ⌘-arrangement, liquids of indefinite composition (oils, etc.) being placed at the end in alphabetical order. The C-component is H₂O.

The D-component, where given, is a solute in the aqueous layer.

Les constituants A (les substances distribuées) sont des composés dont la formule clé commence par 16; arrangement ⌘. Sous chaque constituant A, les constituants B sont de même disposés suivant l'arrangement ⌘; les liquides de composition non définie (huiles, etc.) étant placés à la fin dans l'ordre alphabétique. Le constituant C est H₂O.

Le constituant D, représente, lorsqu'il est mentionné, un corps dissout dans la couche aqueuse.

Die A-Komponente (die verteilte Komponente) ist eine Verbindung, deren Schlüssel-formel mit 16 beginnt; die ⌘-Anordnung. Unter jeder A-Komponente steht, gleichfalls in der ⌘-Anordnung, die B-Komponente. Flüssigkeiten unbestimmter Zusammensetzung (Öle, etc.) befinden sich am Ende in alphabetischer Reihenfolge. Die C-Komponente ist H₂O.

Eine D-Komponente ist, wenn angegeben, der gelöste Stoff in der wässrigen Schichte.

I componenti A (le sostanze distribuite tra i due liquidi) sono composti di cui la formula chiave comincia con 16; ordinamento ⌘. Sotto ciascun componente A i componenti B sono disposti pure secondo l'ordinamento ⌘; i liquidi di composizione non definita (olii, etc.) sono messi alla fine in ordine alfabetico. Il componente C è l'acqua.

Il componente D, quando è indicato, è una sostanza disciolta nello strato acquoso.

HCN

B = C₆H₆, Benzene (62, 63); cf. (56)

°C	10 ³ M _A /l _B	K
6	3.25	1.92†
7	14.8*	3.9†
10	3.55	1.72†
16	3.63	1.63†
20	15.4*	3.7†
25	3.75	1.55†

* 10³ [A]_B. † ± 0.05. ‡ ± 0.2.

CHCl₃

B = Olive Oil (25, 121); K = ∞

CH₂O, Formaldehyde

B = CHCl₃, Chloroform (74)
t = 25°C

[A] _B	K' ± 0.001
0.05	0.025
0.1	0.031
0.3	0.054
0.5	0.073
0.7	0.089

B = C₄H₁₀O, Ethyl ether (63)

°C	10 ³ [A] _B	K ± 0.3
0	6.8	8.5
10	6.3	9.2
20	6.3	9.2

B = C₅H₁₂O, Amyl alcohol (74)

t = 25°C

[A] _B	K' ± 0.1
1.0	3.05
3.0	2.05
5.0	1.5
8.0	1.2

CH₂O₂, Formic acid

B = CCl₄ (59)

B = CS₂ (59)

B = CHBr₃, Bromoform (59)

B = CHCl₃, Chloroform (155); cf. (149); at 25 ± 0.5°C, K' = 0.031 ± 0.001 for [A]_B = 0.001

B = C₄H₁₀O, Ethyl ether (5, 156); cf. (26, 53, 129, 135, 149); see also p. 400

B = C₄H₁₀O.—(Continued)

t = 15.0°C (129.5)

[A] _B	K'
0.05	0.40 ± 0.02
0.10	0.41 ± 0.02
0.20	0.43 ± 0.015
0.30	0.44 ± 0.015
0.40	0.45 ± 0.01
0.50	0.46 ± 0.01

t = 18 ± 0.02°C

[A] _B	K' ± 0.005
0.02	0.374
0.05	0.383
0.10	0.393
0.20	0.406
0.40	0.427
0.60	0.446

t = 25 ± 0.5°C

[A] _B	K' ± 0.01
0.002	0.35
0.005	0.38
0.009	0.41
0.013	0.44

B = C₄H₁₀O.—(Continued)

t = 26.3°C (129.5)

[A] _B	K'
0.05	0.35 ± 0.01
0.10	0.36 ± 0.01
0.20	0.37 ± 0.01
0.30	0.374 ± 0.005
0.40	0.384 ± 0.005
0.50	0.393 ± 0.005

B = C₆H₆, Benzene (17); cf. (57, 59, 87, 94); see also p. 400

t = 25 ± 0.03°C

[A] _B	K ± 5
0.012	286
0.015	267
0.020	245
0.025	226
0.035	195

B = C₇H₈, Toluene (59)

B = C₈H₁₀, Xylene (59)

B = Cottonseed oil (59)

B = Kerosene (59)

CH₃O, Methyl alcohol

B = Olive oil; K' = 0.02 (25)

B = Cottonseed oil (179)

CH₅N, Methylamine
B = CHCl₃, Chloroform (109);
cf. (155)

°C	10 ³ [A] _B	K ± 0.05
18*	9.53	8.49
25	15.7	7.98
32.35	19.7	5.99

* ± 0.005.

B = C₄H₁₀O, Ethyl ether (156);
at 25 ± 0.5°C, K' = 0.113 ±
0.003 for [A]_B = 0.0006 -
0.0039

B = C₅H₁₂O, Amyl alcohol (69)
B = C₈H₁₀, Xylene (155)

C₂HCl₃O₂, Trichloroacetic acid
B = C₄H₁₀O, Ethyl ether (156)

[A] _B	K' ± 0.05
0.001	0.48
0.005	1.05
0.010	1.48
0.015	1.81

B = C₅H₁₀, Amylene (115, 149)
B = C₆H₆, Benzene (42, 115, 149)

[A] _B	K
0.0005	107 ± 2
0.0007	91 ± 2
0.0012	75 ± 1
0.0018	64 ± 1
0.003	52.0 ± 0.5
0.007	35.0 ± 0.3
0.015	24.2 ± 0.3
0.04	15.5 ± 0.2
0.10	9.6 ± 0.1
0.15	7.5 ± 0.1

[A] _B	K
0.015	22 ± 1
0.04	14.8 ± 0.5
0.10	9.2 ± 0.5
0.15	7.0 ± 0.2
0.25	5.1 ± 0.2
0.40	4.3 ± 0.2

C₂H₂Cl₂O₂ Dichloroacetic acid
B = C₄H₁₀O, Ethyl ether (156)

[A] _B	K'
0.002	1.04 ± 0.04
0.005	1.49 ± 0.04
0.01	1.99 ± 0.08
0.015	2.32 ± 0.08
0.025	2.68 ± 0.08

B = C₆H₆, Benzene (42, 58)
t = 13-15°C

[A] _B	K
0.03	22 ± 2
0.06	19 ± 2
0.09	18 ± 2

[A] _B	K
0.0005	66 ± 1
0.001	51.5 ± 1
0.002	43 ± 1
0.005	34.3 ± 0.5
0.01	27.2 ± 0.5

C₂H₂O₄, Oxalic acid
B = C₄H₁₀O, Ethyl ether (21,
127, 155); cf. (8, 49, 149, 156)

[A] _B	K
0.0041	17 ± 2
0.01	14 ± 1
0.02	12.6 ± 0.5
0.03	11.8 ± 0.5

[A] _B	K
0.0454	100 ± 5
0.03168	61 ± 2
0.03465	42 ± 1
0.0041	21.7 ± 0.5
0.01	16.8 ± 0.2
0.02	14.9 ± 0.2
0.03	13.9 ± 0.2

[A] _B	K
0.0023	19 ± 3
0.01	17 ± 1
0.02	14.9 ± 0.5
0.03	13.8 ± 0.5
0.04	13.1 ± 0.5
0.06	12.1 ± 0.5

B = C₄H₁₀O, Ethyl ether +
C₅H₁₂O, Amyl alcohol (mix-
tures) (71)

B = C₄H₁₀O, Ethyl ether (49,
127)

D = Aqueous solutions of
H₂SO₄; NH₄Cl; (NH₄)₂-
C₂O₄; Na₂C₂O₄

B = C₅H₁₂O, Amyl alcohol (69,
158)

[A] _B	K'
0.01	0.231
0.025	0.281
0.05	0.326
0.15	0.403
0.225	0.423

C₂H₃BrO₂, Bromoacetic acid
B = CHCl₃, Chloroform (155)
B = C₄H₁₀O, Ethyl ether (156)
B = C₈H₁₀, Xylene (155)

[A] _B	K'
0.02	1.04 ± 0.04
0.005	1.49 ± 0.04
0.01	1.99 ± 0.08
0.015	2.32 ± 0.08
0.025	2.68 ± 0.08

B = CS₂ (73)

[A] _B	K'
0.02	1.04 ± 0.04
0.005	1.49 ± 0.04
0.01	1.99 ± 0.08
0.015	2.32 ± 0.08
0.025	2.68 ± 0.08

B = CHBr₃, Bromoform (73,
155)

t = 25°C

B = CHBr₃.—(Continued)

[A] _B	10 ³ K'
0.15	3.1 ± 0.3
0.4	5.2 ± 0.3
0.8	8.7 ± 0.5
1.2	12.4 ± 0.5

B = CHCl₃, Chloroform (73,
155, 156)

t = 25°C

10 ³ [A] _B	10 ³ K'
0.625	14.6 ± 0.7
1.25	18.3 ± 0.7
2	20.4 ± 0.7
4	25.0 ± 0.7
6	29.0 ± 0.7
25	50.5 ± 1
50	57 ± 1
100	63 ± 3
200	68 ± 3
300	70 ± 3
500	77 ± 3
750	101 ± 3

B = C₄H₁₀O, Ethyl ether (63,
143, 156)

t = 18°C

[A] _B	K'
0.02	1.99
0.05	2.18
0.1	2.32
0.3	2.57
0.6	2.70
1.2	2.81

t = 25°C

[A] _B	K'
0.002	1.16 ± 0.05
0.005	1.40 ± 0.05
0.01	1.6 ± 0.1
0.015	1.7 ± 0.1
0.02	1.8 ± 0.1

B = C₄H₁₀O, Ethyl ether (63,
143)

D = Aqueous solutions of
H₂SO₄; NaC₂H₂ClO₂

B = C₆H₆, Benzene (58, 70, 155)
t = 13-15°C

[A] _B	K' ± 0.001
0.02	0.025
0.03	0.0255
0.04	0.027
0.05	0.028

t = 25°C

[A] _B	K'
0.02	0.026
0.03	0.029
0.04	0.0305
0.05	0.032
0.1	0.036
0.2	0.039
0.3	0.0425
0.4	0.051

B = C₇H₈, Toluene (70, 155)

t = 25°C

[A] _B	10 ³ K'
0.01	19.4 ± 0.4
0.05	25.7 ± 0.4
0.1	27.8 ± 0.4
0.2	32.8 ± 0.5

B = C₇H₈.—(Continued)

t = 25°C.—(Continued)

[A] _B	10 ³ K'
0.3	39.0 ± 0.5
0.5	55.0 ± 0.5

C₂H₃Br₃O₂, Bromal hydrate
(6, 108)

B = Olive oil at room temp.,
K' = 0.67 ± 0.05

C₂H₃Cl₃O₂, Chloral hydrate

B = C₄H₁₀O, Ethyl ether (63)

°C	[A] _B	K ± 0.002
0	0.764	0.233
10	0.764	0.233
20	0.766	0.235
30	0.766	0.236

B = C₆H₆, Benzene (18)

B = C₇H₈, Toluene (63)

°C	[A] _B	K ± 1
0	0.011	74.5
10	0.011	64.5
20	0.015	58.0

B = Olive oil (6, 107, 108, 118)

°C	g A/kg B	10 ³ K'
3	0.8	5.3 ± 0.5
Room		22 ± 2
30	2.7	24 ± 2

C₂H₄Cl₂, Ethylene chloride

B = Olive oil (25); at room
temp., K' = 60 ± 5

C₂H₄OS, Thioacetic acid

B = C₄H₁₀O, Ethyl ether (156)

C₂H₄O₂, Acetic acid

B = CCl₄ (73, 145, 155); cf.
(171)

[A] _B	K' ± 0.003
0.25	0.060
1.0	0.106
2.0	0.172
3.0	0.243
4.0	0.315

B = CCl₄ + CS₂ (mixtures)
(67, 71)

B = CS₂ (73, 145); cf. (171)

[A] _B	K' ± 0.001
0.5	0.043
0.6	0.049
0.7	0.055
0.8	0.061
0.9	0.0675
1.0	0.0735

B = CHBr₃, Bromoform (73,
145, 155)

[A] _B	K'
0.5	0.103 ± 0.003
1.0	0.132 ± 0.003
2.0	0.198 ± 0.005
3.0	0.270 ± 0.005
4.0	0.35 ± 0.01

$C_2H_4O_2$.—(Continued)
 B = $CHCl_3$, Chloroform (34, 73, 139, 145, 155); cf. (28, 149, 171)

$t = 20^\circ C$	
[A] _B	K
0.002	36.2 ± 0.2
0.004	31.2 ± 0.2
0.006	27.7 ± 0.2
0.008	25.25 ± 0.1
0.010	23.5 ± 0.1
0.012	22.1 ± 0.1
0.02	18.55 ± 0.1
0.04	14.05 ± 0.1
0.06	11.95 ± 0.05
0.08	10.60 ± 0.05
0.10	9.68 ± 0.05
0.12	8.94 ± 0.05
0.14	8.36 ± 0.05
0.16	7.84 ± 0.03
0.18	7.43 ± 0.03
0.20	7.10 ± 0.03
0.22	6.82 ± 0.03
$t = 25^\circ C$	
0.03	15.92 ± 0.05
0.04	14.36 ± 0.05
0.06	12.33 ± 0.05
0.08	10.98 ± 0.05
0.10	10.02 ± 0.05
0.12	9.32 ± 0.04
0.14	8.77 ± 0.04
0.16	8.29 ± 0.04
0.18	7.86 ± 0.03
0.20	7.50 ± 0.03
0.22	7.19 ± 0.03
0.24	6.94 ± 0.03
0.26	6.73 ± 0.03
0.4	5.55 ± 0.05
0.7	4.45 ± 0.1
1.0	3.8 ± 0.1
1.5	3.2 ± 0.1
2.0	2.8 ± 0.1
2.5	2.6 ± 0.1
3.0	2.4 ± 0.1
3.5	2.25 ± 0.1
4.0	2.2 ± 0.1

B = $CHCl_3$, Chloroform (34, 45, 139)

D = Aqueous solutions of HCl; H_2SO_4 ; HNO_3 ; NH_4NO_3 ; $Ba(NO_3)_2$; $LiNO_3$; $NaCl$; $NaC_2H_3O_2$; KCl ; $KClO_3$; $KClO_4$; K_2SO_4 ; $NaOH$, and the following acids separately: citric, malic, succinic, tartaric

B = $C_4H_8O_2$, Ethyl acetate (171)

B = $C_4H_{10}O$, Ethyl ether (62, 88, 100, 103); cf. (8, 55, 63, 110, 127, 149, 156, 171); v. also p. 400

B = $C_4H_{10}O$.—(Continued)

K ± 0.02	
[A] _B *	
	0°C†
0.02	1.85
0.05	1.82
0.10	1.79
0.20	1.72
0.40	1.61
0.60	1.52
0.80	1.45
[A] _B	K ± 0.01
	10°C
0.02	1.99
0.05	1.955
0.10	1.91
0.20	1.83
0.40	1.72
0.60	1.62
0.80	1.53
	20°C
0.02	2.10
0.05	2.055
0.10	2.005
0.20	1.93
0.40	1.81
0.60	1.71
0.80	1.62
t = 18°C	
[A] _B	K ± 0.01
0.05	2.03
0.10	1.98
0.25	1.87
0.50	1.735
0.75	1.625
1.0	1.53
1.5	1.385
2.0	1.29
2.5	1.21
3.0	1.15
3.5	1.10
4.0	1.06
4.5	1.03
°C	[A] _B
7.5	0.918
12	0.881
13	0.345
27	0.325
K ± 0.02	
	1.45
	1.52
	1.76
	1.94

* At $0 \pm 0.2^\circ C$, $K = 2.03 \pm 0.02$ for [A]_B in M/l of solvent = 0.000709; at $25^\circ C$, $K = 2.21 \pm 0.02$, for [A]_B in M/l of solvent = 0.000665.

† At 0 and $5^\circ C$, probable error, ± 1–2°C.

B = $C_4H_{10}O$, Ethyl ether (88, 89, 90, 100, 103); cf. (63)

D = Aqueous solutions of ethyl alcohol; $MgCl_2$; $MgSO_4$; $BaCl_2$; $NaCl$; $NaBr$; Na_2SO_4 ; $NaNO_3$; KCl ; KBr ; KI ; K_2SO_4 ; KNO_3 ; acetates of the following: NH_4 , Pb^{++} , Zn , Cd , Hg^{++} , Ag , Cu^{++} , Fe^{++} , Fe^{+++} , Co , Ni , Cr^{+++} , Al , La , Mg , Na , K

B = $C_5H_{12}O$, Amyl alcohol (69, 145, 158); cf. (171)

B = $C_5H_{12}O$.—(Continued)

°C	[A] _B	K' ± 0.01
20	0.6	0.92
25	0.8	0.93

B = $C_6H_5NO_2$, Nitrobenzene (171)

B = C_6H_6 , Benzene (17, 62, 70, 92, 145); cf. (18, 47, 87, 94, 114, 149, 171); v. also p. 400

$t = 15-16^\circ C$

[A] _B	K
0.184	14.3 ± 0.1
0.050	23.8 ± 0.2
0.0041	55.1 ± 0.3
0.0018	60.7 ± 0.8
0.00042	80.1 ± 1

$t = 25 \pm 0.03^\circ C$

[A] _B	K
3.11	3.580 ± 0.005
2.69	4.016 ± 0.005
1.46	5.95 ± 0.01

$t = 25^\circ C$

[A] _B	K
1.09	6.93 ± 0.01
0.739	8.26 ± 0.01
0.614	8.87 ± 0.01
0.486	9.76 ± 0.03
0.256	12.9 ± 0.03
0.224	13.29 ± 0.05
0.158	16.4 ± 0.05
0.1015	18.30 ± 0.05
0.0714	21.15 ± 0.1
0.0443	25.9 ± 0.1
0.0165	38.4 ± 0.2
0.0125	42.5 ± 0.2

At $6^\circ C$, $K = 59.5 \pm 1$, for [A]_B in moles per l of solvent = 0.000032; at $18.5^\circ C$, $K = 54.5 \pm 1$, for [A]_B in moles per l of solvent = 0.000036.

B = C_6H_6 , Benzene (47)

D = Aqueous solution of $NaC_2H_3O_2$

B = C_7H_6O Benzaldehyde (171)

B = C_7H_8 , Toluene (70, 145, 155); cf. (171)

$t = 25^\circ C$

[A] _B	10 ² K'
0.01	2.00 ± 0.02
0.1	4.40 ± 0.05
0.3	7.02 ± 0.08
0.5	8.7 ± 0.1
0.7	10.1 ± 0.1
1.0	11.95 ± 0.1
1.3	13.6 ± 0.1

B = C_8H_{10} , o-Xylene (70, 145)

$t = 25^\circ C$

[A] _B	K'
0.1	0.048 ± 0.001
0.3	0.066 ± 0.001
0.6	0.088 ± 0.003
1.0	0.114 ± 0.003
1.5	0.146 ± 0.005
2.0	0.173 ± 0.005
2.5	0.200 ± 0.005

B = C_8H_{10} , m-Xylene (70, 145)

[A] _B	K'
0.02	0.0222 ± 0.0005
0.1	0.041 ± 0.001
0.2	0.053 ± 0.001
0.3	0.062 ± 0.001
0.4	0.069 ± 0.001
0.6	0.083 ± 0.001
0.8	0.095 ± 0.001
1.0	0.106 ± 0.001

B = C_8H_{10} , p-Xylene (70, 145)

[A] _B	K'
0.1	0.0550 ± 0.0005
0.5	0.078 ± 0.001
1.0	0.109 ± 0.001
1.5	0.141 ± 0.001
2.0	0.172 ± 0.001
2.3	0.191 ± 0.001

B = $C_{10}H_{12}$, Tetralin (77)

$t = 25^\circ C$

[A] _B	K
0.04	48 ± 2
0.1	36 ± 2
0.2	28 ± 1
0.4	19.9 ± 0.5
0.7	14.5 ± 0.5
1.0	12.0 ± 0.5

B = $C_{10}H_{18}$, Decalin (77)

$t = 25^\circ C$

[A] _B	K
0.05	106 ± 2
0.10	81 ± 2
0.15	66 ± 1
0.20	56 ± 1
0.25	49 ± 1

B = Cottonseed oil (59)

B = Kerosene (59)

B = Kerosene (24)

D = Aqueous solutions of $CaCl_2$; KCl

B = Petroleum ether (171)

$C_2H_4O_3$, Glycollic acid
 B = $C_4H_{10}O$, Ethyl ether (129); at $15^\circ C$, $K = 32 \pm 1$; at $26^\circ C$, $K = 38 \pm 1$

C_2H_6O , Ethyl alcohol
 B = CCl_4 (19); v. also p. 400; at $25^\circ C$, $K' = 0.0244 \pm 0.0005$, for [A]_B = 0.0097–0.0553

B = CS_2 (19); v. also p. 400; at $25^\circ C$, $K' = 0.0143 \pm 0.0005$ for [A]_B = 0.0059–0.222

B = $C_4H_{10}O$, Ethyl ether; v. p. 401

B = C_6H_5Br , Bromobenzene (19); v. p. 401

B = C_6H_6 , Benzene (110); cf. (18); v. also p. 401

C₃H₉N .—(Continued)	
B = C ₇ H ₈ .—(Continued)	
°C	K
10	4.5 ± 0.15
20	2.9 ± 0.1
30	1.95 ± 0.1
40	1.35 ± 0.05
60	0.76 ± 0.03
90	0.47 ± 0.03
B = C ₈ H ₁₀ , Xylene (155)	
C ₄ H ₄ Br ₂ O ₄ , 1, 2-Dibromosuccinic acid	
B = C ₄ H ₁₀ O, Ethyl ether (21); at 25 ± 0.01°C, K = 0.059 ± 0.001 for [A] _B = 0.531	
C ₄ H ₄ N ₂ , Succinonitrile	
B = CHCl ₃ , Chloroform (63)	
B = CHCl ₃ , Chloroform (63)	
D = Aqueous solutions of HCl; KOH; KCl	
C ₄ H ₄ O ₄ , Fumaric acid	
B = C ₄ H ₁₀ O, Ethyl ether (21, 156); cf. (140)	
t = 25 ± 0.5°C	
[A] _B	K
0.001	1.7 ± 0.1
0.002	1.4 ± 0.1
t = 25 ± 0.01°C	
0.005	1.1 ± 0.1
0.01	0.90 ± 0.05
0.02	0.82 ± 0.05
0.03	0.79 ± 0.05
C ₄ H ₄ O ₄ , Maleic acid	
B = C ₄ H ₁₀ O, Ethyl ether (21, 155); cf. (140, 156)	
t = 25 ± 0.01°C	
[A] _B	K
0.00023	23.7 ± 0.5
0.00057	17.8 ± 0.5
0.001	15.5 ± 0.2
0.003	11.9 ± 0.2
0.005	10.9 ± 0.1
0.01	9.65 ± 0.1
C ₄ H ₅ BrO ₄ , Bromosuccinic acid	
B = C ₄ H ₁₀ O, Ethyl ether (21, 156)	
B = C ₈ H ₁₀ , Xylene (155)	
C ₄ H ₅ Cl ₃ O ₂ , Trichlorobutyric acid	
B = C ₅ H ₁₀ , Amylene (115, 149)	
B = C ₆ H ₆ , Benzene (42, 115, 149)	
C ₄ H ₆ O ₂ , α-Crotonic acid	
B = CHCl ₃ , Chloroform (155)	
B = C ₄ H ₁₀ O, Ethyl ether (156)	
B = C ₈ H ₁₀ , Xylene (155)	
C ₄ H ₆ O ₄ , Succinic acid	
B = CHCl ₃ , Chloroform (155)	
t = 25 ± 0.5°C	
[A] _B	K' ± 0.0005
0.00015	0.0110
0.0003	0.0143
0.0006	0.0176
0.0010	0.0201

B = C ₄ H ₁₀ O, Ethyl ether (21, 51, 127, 155, 156); cf. (8, 140, 149)	
t = 0 ± 0.01°C	
[A] _B	K ± 0.05
0.001	4.83
0.002	4.71
0.003	4.62
0.005	4.52
0.015	4.44
t = 15°C	
[A] _B	K ± 0.03
0.015	6.30
0.03	6.23
0.05	6.14
0.08	6.02
t = 20°C	
0.015	6.98
0.03	6.92
0.05	6.84
0.08	6.74
0.10	6.67
t = 25 ± 0.01°C	
0.0005	8.49*
0.001	8.13*
0.002	7.87*
0.003	7.80*
t = 25°C	
0.015	7.74
0.03	7.67
0.05	7.57
0.08	7.45
0.10	7.36
* ± 0.08.	
B = C ₅ H ₁₂ O, Amyl alcohol (69, 158)	
t = 20°C	
[A] _B	K' ± 0.015
0.035	0.690
0.2	0.650
0.35	0.615
B = C ₁₀ H ₂₂ O, Amyl ether (149)	
C ₄ H ₆ O ₅ , Malic acid	
B = C ₄ H ₁₀ O, Ethyl ether (127); cf. (8); at 15°C, K = 63 ± 2 for [A] _B = 0.009–0.016; at 25.5°C, K = 71 ± 2 for [A] _B = 0.002–0.017	
C ₄ H ₆ O ₆ , Tartaric acid	
B = C ₄ H ₁₀ O, Ethyl ether (127); cf. (8, 149, 156)	
[A] _B	K ± 5
	15°C
0.002	216
0.004	209
0.007	198
	27°C
	266
	253
	234
C ₄ H ₇ Cl ₃ O ₂ , 1, 1, 2-Trichlorobutyraldehyde hydrate	
B = Olive oil; at room temp., K' = 1.6 ± 0.1 (6, 108)	
C ₄ H ₈ O, Methyl ethyl ketone	
B = Olive oil (25); K' = 2.3 ± 0.2	

C ₄ H ₈ O ₂ , n-Butyric acid	
B = CHCl ₃ , Chloroform (155)	
t = 25 ± 0.5°C	
[A] _B	K' ± 0.02
0.0005	0.47
0.0007	0.50
0.0010	0.53
0.0015	0.55
0.0022	0.56
B = C ₄ H ₁₀ O, Ethyl ether (156)	
t = 25 ± 0.5°C	
[A] _B	K' ± 0.2
0.0015	4.2
0.003	4.5
0.006	4.9
0.010	5.1
0.014	5.3
B = C ₄ H ₁₀ O, Ethyl ether (89)	
D = Aqueous solution of NaCl	
B = C ₆ H ₆ , Benzene (17, 57); cf. (87, 94)	
t = 13–15°C	
[A] _B	K
0.15	0.77 ± 0.03
0.20	0.68 ± 0.03
0.25	0.61 ± 0.03
0.30	0.56 ± 0.03
t = 25 ± 0.03°C	
0.025	1.725 ± 0.01
0.05	1.235 ± 0.01
0.10	0.930 ± 0.005
0.15	0.788 ± 0.005
0.20	0.697 ± 0.003
0.25	0.635 ± 0.003
0.30	0.591 ± 0.003
0.50	0.473 ± 0.003
1.0	0.388 ± 0.003
2.0	0.33 ± 0.02
3.0	0.31 ± 0.02
4.0	0.34 ± 0.02
B = C ₈ H ₁₀ , Xylene (155); at 25 ± 0.5°C, K' = 0.158 ± 0.005 for [A] _B = 0.0007–0.0013	
B = Cottonseed oil (59)	
B = Kerosene (24)	
D = Aqueous solutions of CaCl ₂ ; KCl	
C ₄ H ₈ O ₂ , Isobutyric acid	
B = CCl ₄ (158)	
B = CHCl ₃ , Chloroform (149, 155)	
B = C ₄ H ₁₀ O, Ethyl ether (156)	
B = C ₆ H ₆ , Benzene (87, 94, 149, 158)	
B = C ₇ H ₈ , Toluene (158)	
B = C ₈ H ₁₀ , Xylene (155)	
C ₄ H ₈ O ₂ , Ethyl acetate	
B = C ₆ H ₆ , Benzene (124); at 20°C, K' = 12.20 ± 0.05 for g A/lc = 0.8–2.5	
B = C ₆ H ₆ , Benzene (124, 125)	
D = Aqueous solutions of NH ₄ Cl; NH ₄ NO ₃ ;	

(NH ₄) ₂ SO ₄ ; MgSO ₄ ; LiCl; Li ₂ SO ₄ ; NaCl; Na ₂ SO ₄ ; NaNO ₃ ; KCl; K ₂ SO ₄ ; KNO ₃ ; Glycerol; Dextrose; Sucrose	
B = Olive oil (25); at room temp., K' = 1.8 ± 0.2	
B = Petroleum ether, B. P., 90–110° (124)	
B = Petroleum ether, B. P., 90–110° (124)	
D = Aqueous solutions of NaCl; Sucrose	
C ₄ H ₈ O ₃ , 1 (2)-Hydroxybutyric acid	
B = C ₄ H ₁₀ O, Ethyl ether (156)	
C ₄ H ₈ O ₅ , 3, 4, 5-Trihydroxybutyric acid	
B = Olive oil (11); at 25°C, K' = 0.025 ± 0.002, calculated from separate solubilities	
C ₄ H ₉ NO ₂ , Methylurethane	
B = Olive oil (6, 108); at room temp., K' = 0.04 ± 0.01	
C ₄ H ₁₀ O, Isobutyl alcohol	
B = Cottonseed oil (179)	
B = Olive oil (121); K' = 6 ± 1	
C ₄ H ₁₀ O, tert.-Butyl alcohol	
B = Olive oil (6); at room temp., K' = 0.175 ± 0.01	
C ₄ H ₁₁ N, n-Butylamine	
B = C ₄ H ₁₀ O, Ethyl ether (156)	
t = 25 ± 0.5°C	
[A] _B	K' ± 0.03
0.001	0.90
0.002	1.00
0.003	1.07
B = C ₈ H ₁₀ , Xylene (155)	
t = 25 ± 0.5°C	
[A] _B	K' ± 0.02
0.0005	0.52
0.001	0.61
0.002	0.70
0.003	0.75
0.004	0.78
C ₄ H ₁₁ N, Isobutylamine	
B = C ₈ H ₁₀ , Xylene (155)	
C ₄ H ₁₁ N, Diethylamine	
B = CCl ₄ (158)	
B = CHCl ₃ , Chloroform (155)	
t = 25 ± 0.5°C	
[A] _B	K' ± 0.08
0.001	2.18
0.002	2.50
0.005	3.09
0.01	3.61
0.02	4.23
B = C ₂ H ₄ Cl ₂ , Ethylene chloride (158)	
B = C ₄ H ₉ Br, n-Butyl bromide (158)	
B = C ₄ H ₁₀ O, n-Butyl alcohol (158)	

B = C₄H₁₀O, Isobutyl alcohol (158)

B = C₄H₁₀O, Ethyl ether (156); at 25 ± 0.5°C, K' = 0.71 ± 0.02 for [A]_B = 0.00044–0.0063

B = C₅H₁₂O, Amyl alcohol (158)
B = C₆H₃Cl₃, 1, 3, 4-Trichlorobenzene (158)

B = C₆H₄Cl₂, *o*-Dichlorobenzene (158)

B = C₆H₅Br, Bromobenzene (158)

B = C₆H₆, Benzene (158)

t = 25 ± 0.5°C

[A] _B	K' ± 0.02
0.002	0.61
0.005	0.69
0.009	0.76

B = C₇H₈, Toluene (109)

°C	[A] _B	K
± 0.005		± 0.005
18	0.0230	2.141
25	0.0223	1.596
32.35	0.1104	1.094

B = C₈H₁₀, Xylene (155)

t = 25 ± 0.5°C

[A] _B	K' ± 0.02
0.0005	0.37
0.001	0.43
0.002	0.50
0.004	0.56
0.008	0.59

B = C₈H₁₈O, *n*-Butylether (158)

B = C₈H₁₈O, *sec.*-Octyl alcohol (158)

B = C₁₁H₁₆O, Isoamyl phenyl ether (158)

B = Paraffin oil (158)

B = Petroleum ether, B. P., 145–155° (158)

C₅H₅N, Pyridine

B = CHCl₃, Chloroform (155)

t = 25 ± 0.5°C

[A] _B	K' ± 0.3
0.0013	5.6
0.003	8.1
0.005	9.2
0.010	10.6
0.017	11.2

B = C₆H₆, Benzene (62, 155, 178.5); *cf.* (58)

t = 25°C

M _A /l _B	K
0.000271	0.41 ± 0.02
0.000546	0.38 ± 0.02
0.001	0.35 ± 0.01
0.002	0.34 ± 0.01
0.004	0.34 ± 0.01

B = C₇H₈, Toluene (63, 155); *cf.* (149)

t = 25°C

[A] _B	K
0.001	0.70 ± 0.08
0.006	0.56 ± 0.04

B = C₇H₈: 25°C.—(Continued)

[A] _B	K
0.011	0.51 ± 0.02
0.025	0.48 ± 0.01
0.08	0.461 ± 0.005
0.12	0.456 ± 0.005

B = C₈H₁₀, Xylene (155); at 25 ± 0.5°C, K' = 1.92 ± 0.06 for [A]_B = 0.0019–0.019

C₅H₆O₄, Itaconic acid

B = C₄H₁₀O, Ethyl ether (21)

C₆H₈O₃, Levulinic acid

B = CHCl₃, Chloroform (155)

B = C₄H₁₀O, Ethyl ether (156)

B = C₈H₁₀, Xylene (155)

C₅H₈O₄, Glutaric acid

B = CHCl₃, Chloroform (155)

B = C₄H₁₀O, Ethyl ether (21, 155, 156)

C₆H₁₀O₂, Valeric acid

B = CHCl₃, Chloroform (155)

t = 25 ± 0.5°C

[A] _B	K' ± 0.08
0.001	1.93
0.002	2.23
0.003	2.39
0.005	2.55

B = C₄H₁₀O, Ethyl ether (156); at 25 ± 0.5°C, K' = 13.5 ± 0.5 for [A]_B = 0.001–0.0057

B = C₆H₆, Benzene (17)

t = 25 ± 0.03°C

[A] _B	K ± 0.003
0.0292	0.466
0.0481	0.370
0.08	0.295
0.2	0.196*
0.3	0.164*
0.445	0.137*
0.929	0.0989†
1.4	0.0821†
1.848	0.0734†

* ± 0.001.

† ± 0.0005.

B = C₈H₁₀, Xylene (155)

t = 25 ± 0.5°C

[A] _B	K' ± 0.03
0.001	0.63
0.003	0.89
0.007	1.18
0.012	1.39

C₅H₁₀O₂, Isovaleric acid

B = CHCl₃, Chloroform (155)

B = C₄H₁₀O, Ethyl ether (156)

B = C₄H₁₀O, Ethyl ether
D = Aqueous solution of NaCl (89)

B = C₆H₆, Benzene (87)

B = C₈H₁₀, Xylene (155)

C₆H₁₀O₄, Monacetin

B = Olive oil (6, 107, 108)

°C	g A/kg B	K' ± 0.02
3	0.023	0.1
Room		0.06
36	0.016	0.07

C₅H₁₂ClN, *ε*-Chloroamylamine

B = C₂H₂Cl₄, Tetrachloroethane (54)

B = C₆H₅NO₂, Nitrobenzene (54)

B = C₆H₆, Benzene (54)

C₅H₁₁N, Piperidine

B = CHCl₃, Chloroform (155)

t = 25 ± 0.5°C

[A] _B	K' ± 0.1
0.0008	2.0
0.0015	2.35
0.003	2.9
0.004	3.1
0.005	3.35
0.006	3.55

B = C₄H₁₀O, Ethyl ether (156)

t = 25 ± 0.5°C

[A] _B	K' ± 0.015
0.002	0.66
0.005	0.70
0.008	0.73
0.012	0.765
0.018	0.79

B = C₆H₆, Benzene (62); *cf.* (58)

t = 25°C

[A] _B /l _B	K ± 0.1
0.0001	2.55
0.0002	1.9
0.0003	1.7
0.0005	1.45
0.0008	1.30*
0.0012	1.20*
0.002	1.10*
0.003	1.05*

* ± 0.05.

B = C₆H₆, Benzene (62)

D = Aqueous solutions of NaOH; NaCl; Piperidine hydrochloride

B = C₈H₁₀, Xylene (155)

t = 25 ± 0.5°C

[A] _B	K' ± 0.01
0.0005	0.37
0.001	0.44
0.002	0.53
0.003	0.56
0.004	0.57

C₅H₁₁NO, Valeramide

B = Olive oil (64); at 15°R, K' = 0.31 ± 0.03 for g A/l_B = 2.41

C₅H₁₂O, Isoamyl alcohol

B = Cottonseed oil (179)

C₅H₁₂O, Amylene hydrate

B = Olive oil (6); at room temp., K' = 1.0 ± 0.1 for g A/l_B = 33

C₅H₁₂O₄S₂, Diethylsulfonmethane

B = Olive oil (6); at room temp., K' = 0.15 ± 0.01 for g A/l_B = 0.68

C₅H₁₂O₄S₂, Dimethylsulfonmethylnmethane

B = Olive oil (6); at room temp., K' = 0.11 ± 0.01 for g A/l_B = 0.12–0.62

C₅H₁₃N, *n*-Amylamine

B = CHCl₃, Chloroform (155)

t = 25 ± 0.5°C

[A] _B	K' ± 0.3
0.0007	5.9
0.001	7.3
0.0015	9.1
0.002	10.6
0.0025	12.0

B = C₈H₁₀, Xylene (155)

C₅H₁₃N, Isoamylamine

B = C₄H₁₀O, Ethyl ether (156); at 25 ± 0.5°C, K' = 1.9 ± 0.1 for [A]_B = 0.00039–0.00184

B = C₈H₁₀, Xylene (155)

C₆H₃N₃O₇, Picric acid

B = CHBr₃, Bromoform (73, 155)

t = 25°C

[A] _B	K' ± 0.03
0.4	1.18
0.6	1.34
0.8	1.48
1.0	1.60

B = CHCl₃, Chloroform (73, 155)

t = 25°C

[A] _B	K' ± 0.03
0.3	1.30
0.6	1.73
0.9	2.05
1.2	2.33
1.5	2.58

B = CHCl₃, Chloroform + C₄H₁₀O, Ethyl ether (mixtures) (71)

B = C₄H₁₀O, Ethyl ether (151)
B = C₅H₁₂O, Amyl alcohol (69, 158); *cf.* (151)

t = 25°C

[A] _B	K' ± 0.07
0.005	1.75
0.02	2.14
0.05	2.71
0.10	3.29
0.20	3.82
0.26	3.98

B = C₆H₆, Benzene (92, 138, 158, 172); *cf.* (170.5)

t = 15–18°C

[A] _B	K'
0.000932	2.23 ± 0.02
0.00225	1.45 ± 0.01
0.01	0.705 ± 0.005
0.02	0.505 ± 0.005
0.05	0.320 ± 0.005
0.10	0.240 ± 0.005
0.18	0.187 ± 0.002

$C_6H_3N_3O_7$.—(Continued)
 $B = C_7H_8$, Toluene (70); cf. (149, 151)

$t = 25^\circ C$

[A] _B	K'
0.01	1.7 ± 0.2
0.05	3.0 ± 0.2
0.1	4.1 ± 0.2
0.2	5.6 ± 0.1
0.3	6.8 ± 0.1
0.5	8.7 ± 0.1

$B = C_{10}H_{12}$, Tetralin (77)

$t = 25^\circ C$

[A] _B	K
0.02	0.45 ± 0.02
0.03	0.37 ± 0.02
0.05	0.30 ± 0.01
0.10	0.22 ± 0.01

C_6H_6BrN , *m*-Bromoaniline

$B = C_6H_6$, Benzene (50)

C_6H_6BrN , *p*-Bromoaniline

$B = C_6H_6$, Benzene (48); cf. (50); at $25^\circ C$, $K' = 132 \pm 2$ for $g A/l_B = 2.4$

C_6H_6ClN , *m*-Chloroaniline

$B = C_6H_6$, Benzene (50)

C_6H_6ClN , *p*-Chloroaniline

$B = C_6H_6$, Benzene (48); cf. (50); at $25^\circ C$, $K' = 83 \pm 3$ for $g A/l_B = 14.3-28.4$

$C_6H_6N_2O_2$, *o*-Nitroaniline

$B = C_6H_6$, Benzene (48)

$t = 25^\circ C$

[A] _B	$K' \pm 1.0$
0.05	61.5
0.10	64.0
0.15	65.3

$C_6H_6N_2O_2$, *m*-Nitroaniline

$B = C_6H_6$, Benzene (48)

$t = 25^\circ C$

[A] _B	$K' \pm 1.0$
0.05	23.0
0.10	25.0

$C_6H_6N_2O_2$, *p*-Nitroaniline

$B = C_6H_6$, Benzene (48)

$t = 25^\circ C$

[A] _B	$K' \pm 0.5$
0.01	8.6
0.03	9.3

C_6H_6O , Phenol

$B = CCl_4$ (74, 76, 155); cf. (170)

$t = 25^\circ C$

[A] _C	K'
0.05	0.40 ± 0.02
0.1	0.44 ± 0.02
0.2	0.625 ± 0.02
0.3	0.91 ± 0.05
0.4	1.45 ± 0.05
0.49	$3.05 \pm ?$

$B = CS_2$ (74)

$t = 25^\circ C$

[A] _B	K'
0.05	0.62 ± 0.02
0.2	0.80 ± 0.02

$B = CS_2$; $25^\circ C$.—(Continued)

[A] _B	K'
0.5	1.45 ± 0.05
1.0	2.47 ± 0.05
2.0	4.45 ± 0.1
4.0	8.0 ± 0.1

$B = CHBr_3$, Bromoform (74, 155)

$t = 25^\circ C$

[A] _B	$K' \pm 0.2$
0.2	2.7
1.0	4.4
3.0	7.9
5.0	10.5
7.0	12.3

$B = CHCl_3$, Chloroform (74, 76, 155)

$t = 25^\circ C$

[A] _B	$K' \pm 0.1$
0.25	3.45
1.0	5.35
2.0	7.7
3.0	9.65
4.0	11.1
5.0	12.2

$B = C_2Cl_4$, Tetrachloroethylene (76)

$B = C_2HCl_3$, Trichloroethylene (76)

$B = C_2HCl_5$, Pentachloroethane (76)

$B = C_2H_2Cl_4$, Tetrachloroethane (76)

$B = C_5H_{12}O$, Amyl alcohol (69); cf. (158)

$t = 25^\circ C$

[A] _B	K'
0.075-0.26	16.5 ± 1
55	14.3 ± 0.5

$B = C_6H_6$, Benzene (139, 155); cf. (114, 124, 170); see also p. 402

$t = 25^\circ C$

[A] _B	$10^2 K$
0.06	43.8 ± 0.2
0.13	41.2 ± 0.2
0.28	36.3 ± 0.2
0.64	28.5 ± 0.1
1.5	18.6 ± 0.1
3.0	12.23 ± 0.05
5.0	9.00 ± 0.05
6.0	8.30 ± 0.05

$B = C_6H_6$, Benzene (124, 139)

D = Aqueous solutions of LiCl; NaCl; KCl; K_2SO_4

$B = C_7H_8$, Toluene (70, 155)

$t = 25^\circ C$

[A] _B	K'
0.4	2.05 ± 0.05
2.0	3.6 ± 0.1
4.0	5.5 ± 0.2
6.0	7.1 ± 0.2
8.0	8.6 ± 0.2

$B = C_8H_{10}$, *m*-Xylene (70)

$t = 25^\circ C$

[A] _B	K'
0.2	1.55 ± 0.5
2.0	3.05 ± 0.5
4.0	4.7 ± 0.1
6.0	6.3 ± 0.1
8.0	7.9 ± 0.2

$B =$ Olive oil (11); cf. (130); at $25^\circ C$, $K' = 10 \pm 1$

$B =$ Olive oil (130)

D = Aqueous solution of NaCl

$C_6H_6O_2$, Hydroquinol

$B = C_4H_{10}O$, Ethyl ether (126); at $15^\circ C$, $K' = 2.7 \pm 0.5$

$C_6H_6O_2$, Resorcinol

$B = CCl_4$ (170)

$B = C_4H_{10}O$, Ethyl ether (170); $K' = 4.2 \pm 0.4$

$B = C_6H_6$, Benzene (170); $K = 2.6 \pm 0.3$

$B =$ Olive oil (11); at $25^\circ C$, $K' = 0.04 \pm 0.005$ calculated from separate solubilities

C_6H_7N , Aniline

$B = CCl_4$ (170)

$B = C_3H_5O_3$, Lactic acid (3.5)

$B = C_4H_{10}O$, Ethyl ether (170)

$B = C_6H_6$, Benzene (48); at $25^\circ C$, $K' = 10.1 \pm 0.3$ for $g A/l_B = 1.83-0.914$

$B = C_7H_8$, Toluene (133)

$t = 25^\circ C$

[A] _B	$K' \pm 0.2$
0.22*	12.3*
0.1	7.8
1.0	10.2
2.0	12.8
3.0	15.5
4.0	18.2

$t = 48^\circ C$

2.24	13.3
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* $t = 1^\circ C$.

$B = C_7H_8$, Toluene (133)

D = Aqueous solutions of $Ca(OH)_2$; $Ba(OH)_2$; $Sr(OH)_2$; K_2SO_4 ; $K_2B_2O_4$

$B = C_8H_{10}$, Xylene (155)

$t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 0.1$
0.0005	2.95
0.0007	3.4
0.0010	3.95
0.0015	4.65
0.002	5.3

C_6H_8ClN , Aniline hydrochloride

$B = C_6H_7N$, Aniline (150)

$C_6H_8N_2$, Phenylenediamine

$B = C_6H_6$, Benzene (48); at $25^\circ C$, $K' = 0.549 \pm 0.005$ for $g A/l_B = 0.55-4.1$ (ortho);

$K' = 0.179 \pm 0.002$ for $g A/l_B = 0.9-1.6$ (meta)

$C_6H_8O_7$, Citric acid

$B = C_4H_{10}O$, Ethyl ether (127); cf. (129)

$t = 15^\circ C$

[A] _B	$K \pm 2$
0.0015	129
0.004	128

$t = 25.5^\circ C$

[A] _B	$K \pm 3$
0.0015	158
0.004	150
0.007	142

$C_6H_{11}BrN_2O_2$, Bromural

$B =$ Olive oil (118); from $17-20^\circ C$, $K' = 1.3 \pm 0.1$

$C_6H_{12}O_2$, *n*-Caproic acid

$B = CHCl_3$, Chloroform (155)

$t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 0.3$
0.0005	5.2
0.0008	5.7
0.0012	6.1

$B = C_8H_{10}$, Xylene (155)

$C_6H_{12}O_2$, Isocaproic acid

$B = CHCl_3$, Chloroform (155)

$B = C_8H_{10}$, Xylene (155)

$C_6H_{12}O_3$, Hexoic acid

$B = C_6H_6$, Benzene (17)

$t = 25 \pm 0.03^\circ C$

[A] _B	$K \pm 0.0005$
0.2	0.0444
0.3	0.0368
0.4	0.0318
0.6	0.0267

$C_6H_{12}O_2S_4$, Ethylxanthic acid

$B = CS_2$ (61)

$B = CS_2$ (61)

D = Aqueous solution of $MgSO_4$

$B = CHCl_3$, Chloroform (61)

$B = C_5H_{12}O$, Amyl alcohol (61)

$B = C_5H_{12}O$, Amyl alcohol (61)

D = Aqueous solution of $MgSO_4$

$B = C_6H_5NO_2$, Nitrobenzene (61)

$B = C_7H_8O$, Benzyl alcohol (61)

$B = C_7H_8O$, Benzyl alcohol (61)

D = Aqueous solution of $MgSO_4$

$B =$ Ligroin (61)

$C_6H_{12}O_3$, 1-Hydroxyisocaproic acid

$B = CCl_4$ (80); at $25^\circ C$, $K = 0.49 \pm 0.03$ for $[A]_B = 0.065-0.415$

$B = CCl_4$ (80)

D = Aqueous solutions of NaCl; $K_2C_2O_4$

C₆H₁₃N, 1-Methylpiperidine
 B = C₄H₁₀O, Ethyl ether (156)
 B = C₈H₁₀, Xylene (155)

C₆H₁₅N, Dipropylamine
 B = C₄H₁₀O, Ethyl ether (156)
 B = C₇H₈, Toluene (109)
 B = C₈H₁₀, Xylene (155)

C₆H₁₅N, Triethylamine
 B = CHCl₃, Chloroform (155)
 $t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 0.6
0.001	16.1
0.003	19.0
0.006	21.1
0.01	22.6

B = C₅H₁₂O, Amyl alcohol (69, 158)
 B = C₇H₈, Toluene (63, 109);
 cf. (62)

$t = 25^\circ\text{C}$

[A] _B	K ± 0.02
0.0011	0.76*
0.0026	0.69
0.0052	0.44
0.01	0.31
0.02	0.23†
0.07	0.15†
0.13	0.11†

[A]_B = 0.5

°C	K
0	0.47 ± 0.02
10	0.290 ± 0.015
20	0.22 ± 0.01
40	0.145 ± 0.008
60	0.110 ± 0.005
90	0.087 ± 0.005

* ± 0.03 .
 † ± 0.01 .

B = C₈H₁₀, Xylene (155)
 $t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 0.2
0.001	3.2
0.004	4.6
0.006	5.2
0.011	6.1
0.015	6.6

C₆H₁₅N, *n*-Hexylamine
 B = C₈H₁₀, Xylene (155)
 $t = 25 \pm 0.1^\circ\text{C}$

[A] _B	K' ± 0.1
0.001	3.0
0.003	4.2
0.005	4.9
0.01	5.8
0.017	6.2

C₇H₅N₃O₈, 2, 4, 6-Trinitrobenzoic acid
 B = C₄H₁₀O, Ethyl ether (156)

C₇H₄N₂O₆, 2, 4-Dinitrobenzoic acid
 B = CHCl₃, Chloroform (155)
 B = C₄H₁₀O, Ethyl ether (156)
 B = C₈H₁₀, Xylene (155)

C₇H₄N₂O₆, 3, 5-Dinitrobenzoic acid
 B = CHCl₃, Chloroform (155, 162)
 B = C₄H₁₀O, Ethyl ether (156)
 B = C₆H₆, Benzene (164)
 B = C₈H₁₀, Xylene (155)

C₇H₅ClO₂, *o*-Chlorobenzoic acid
 B = CHCl₃, Chloroform (155)
 B = C₄H₁₀O, Ethyl ether (156)
 B = C₈H₁₀, Xylene (155)

C₇H₅IO₂, *o*-Iodobenzoic acid
 B = CHCl₃, Chloroform (155)
 B = C₄H₁₀O, Ethyl ether (156)
 B = C₈H₁₀, Xylene (155)

C₇H₅NO₃S, Saccharin
 B = C₄H₁₀O, Ethyl ether (104)
 D = HCl; at $25 \pm 0.1^\circ\text{C}$,
 K = 0.062 ± 0.001 for g
 A/l_B = 1.3–3.15
 B = C₇H₁₄O₂, Amyl acetate
 D = HCl (104); at $25 \pm 0.1^\circ\text{C}$,
 K = 0.0314 ± 0.0005 for g A/l_B = 1.4–3.45

C₇H₅NO₄, *o*-Nitrobenzoic acid
 B = CHCl₃, Chloroform (155)
 $t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 0.01
0.0006	0.18
0.001	0.23
0.0015	0.27
0.003	0.37

B = C₄H₁₀O, Ethyl ether (156)
 B = C₆H₆, Benzene (164)
 $t = 25^\circ\text{C}$

[A]/kg B	K' ± 0.005
0.005	0.330
0.01	0.420
0.02	0.540
0.03	0.625

$t = 40^\circ\text{C}$

[A]/kg B	K' ± 0.005
0.005	0.390
0.01	0.465
0.02	0.570
0.03	0.645
0.04	0.715
0.06	0.820

B = C₈H₁₀, Xylene (155)
 $t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 0.002
0.0005	0.101
0.0007	0.091
0.0009	0.087

C₇H₅NO₄, *m*-Nitrobenzoic acid
 B = CHCl₃, Chloroform (155)
 $t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 0.02
0.0006	1.23
0.001	1.45
0.0015	1.66

B = C₄H₁₀O, Ethyl ether (156)
 B = C₆H₆, Benzene (164)

B = C₆H₆.—(Continued)
 $t = 25^\circ\text{C}$

[A]/kg B	K' ± 0.05
0.005	1.60
0.02	2.60
0.05	3.85
0.10	5.25
0.15	6.35

$t = 40^\circ\text{C}$

[A]/kg B	K' ± 0.05
0.005	1.60
0.02	2.45
0.05	3.43
0.10	4.57
0.15	5.50
0.25	6.95

B = C₈H₁₀, Xylene (155)

$t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 0.02
0.001	0.82
0.002	0.94
0.003	1.07

C₇H₅NO₄, *p*-Nitrobenzoic acid
 B = CHCl₃, Chloroform (155)

$t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 0.02
0.0006	1.26
0.001	1.49
0.0015	1.71

B = C₈H₁₀, Xylene (155)

$t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 0.02
0.0002	0.48
0.0005	0.67
0.0009	0.84

C₇H₆O₂, Benzoic acid

B = CCl₄ (144)

B = CHCl₃, Chloroform (65, 149, 155)

$t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K ± 0.01
0.001	0.38
0.002	0.32
0.005	0.24

$t = 10^\circ\text{C}$

g A/kg B	K ± 0.001
1	0.215
2	0.156
5	0.106
10	0.076
15	0.0599*
20	0.0510*

$t = 40^\circ\text{C}$

[A]	K' ± 0.001
1	0.277
2	0.213
5	0.141
10	0.108
15	0.0890*
20	0.0767*

* ± 0.0005 .

B = C₄H₁₀O, Ethyl ether (156);
 cf. (8, 149)

$t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K' ± 1
0.001	24
0.005	29
0.010	34
0.014	38

B = C₆H₆, Benzene (23, 47, 114, 158); cf. (65, 149)

$t = 6 \pm 0.1^\circ\text{C}$

[A] _B	K ± 0.001
0.01	0.253
0.02	0.185
0.03	0.151
0.04	0.130
0.05	0.115
0.07	0.096
0.10	0.0808*
0.15	0.0661*
0.20	0.0580*

$t = 20^\circ\text{C}$

0.01	0.228†
0.02	0.17†
0.03	0.144†
0.04	0.129†
0.05	0.117†
0.07	0.101†
0.10	0.085
0.15	0.071
0.20	0.062
0.40	0.0433*
0.60	0.0342*

$t = 25^\circ\text{C}$

0.0015	0.572†
0.005	0.326†
0.01	0.251†
0.02	0.187†
0.03	0.156†
0.04	0.132†
0.05	0.117†
0.07	0.097†
0.10	0.084†
0.15	0.072†
0.20	0.064†

* ± 0.0005 .

† ± 0.005 .

‡ ± 0.002 .

B = C₆H₆, Benzene (47, 161)
 D = Aqueous solutions of
 NaCl; K benzoate
 B = C₇H₈, Toluene (149)
 B = C₇H₅O, Phenyl methyl
 ether (149)
 B = C₈H₁₀, Xylene (155); cf.
 (149)

$t = 25 \pm 0.5^\circ\text{C}$

[A] _B	K'
0.001	1.09 ± 0.05
0.003	1.87 ± 0.01
0.006	2.68 ± 0.01
0.010	3.43 ± 0.02
0.017	4.12 ± 0.02

B = C₈H₁₀O, Phenetole (149)
 B = C₁₀H₂₂O, Amyl ether (149)
 B = Benzene (149)

B = Olive oil (11); at 25°C ,
 K' = 12.5 ± 1 , calculated
 from separate solubilities

C₇H₆O₃, Hydroxybenzoic acid
 B = Olive oil (11); at 25°C ,
 K', calculated from separate
 solubilities = 0.4 ± 0.1 for
m-A; = 0.6 ± 0.1 for *p*-A

$C_7H_6O_3$, *p*-Hydroxybenzoic acid
 $B = C_4H_{10}O$, Ethyl ether (156)

$C_7H_6O_3$, Salicylic acid
 $B = CHCl_3$, Chloroform (65, 149, 155)

$t = 10^\circ C$

g A/kg B	K
0.5	0.635 ± 0.01
1.0	0.47 ± 0.01
2.0	0.344 ± 0.007
3.0	0.286 ± 0.007
5.0	0.225 ± 0.005
6.0	0.202 ± 0.005

$t = 25 \pm 0.5^\circ C$

[A] _B	K
0.0006	0.92 ± 0.03
0.001	0.76 ± 0.03
0.002	0.60 ± 0.02
0.004	0.465 ± 0.015
0.006	0.407 ± 0.015

$t = 40^\circ C$

g A/kg B	K
0.5	0.695 ± 0.01
1.0	0.555 ± 0.01
2.0	0.445 ± 0.007
3.0	0.380 ± 0.007
5.0	0.310 ± 0.005
6.0	0.282 ± 0.005
10.0	0.222 ± 0.002
15.0	0.187 ± 0.002
18.0	0.172 ± 0.002

$B = C_4H_{10}O$, Ethyl ether (156)
 $t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 2$
0.002	26
0.003	29
0.005	34
0.010	43
0.014	49

$B = C_6H_6$, Benzene (65, 114, 149)

$t = 10^\circ C$

g A/kg B	K
0.5	0.63 ± 0.01
1.0	0.49 ± 0.01
2.0	0.375 ± 0.007
3.0	0.325 ± 0.007
4.0	0.292 ± 0.007
5.0	0.268 ± 0.005

$t = 18^\circ C$

0.5	0.70 ± 0.02
1.0	0.51 ± 0.02
2.0	0.36 ± 0.02
3.0	0.32 ± 0.02
4.0	0.29 ± 0.01
5.0	0.27 ± 0.01
6.0	0.25 ± 0.01
8.0	0.21 ± 0.01

$t = 40^\circ C$

0.5	0.61 ± 0.01
1.0	0.50 ± 0.01
2.0	0.410 ± 0.007
3.0	0.363 ± 0.007

$B = C_6H_6$; $40^\circ C$.—(Continued)

g A/kg B	K
4.0	0.331 ± 0.007
5.0	0.307 ± 0.005
6.0	0.287 ± 0.005
8.0	0.260 ± 0.005

$B_s = C_6H_6$, Benzene (161, 163)

D = Aqueous solutions of NaCl; KCl

$B = C_8H_{10}$, Xylene (155)

$t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 0.03$
0.001	0.65
0.002	0.84
0.003	0.99
0.005	1.18

$B = C_6H_6O$, Phenol (5.5)

$t = 25.0^\circ C$

[A] _B	K'
0.1	14.7 ± 0.4
0.2	15.5 ± 0.3
0.3	16.2 ± 0.2
0.5	17.3 ± 0.2

$B = \text{Olive oil (11)}$; $K' = 12 \pm 1$, calculated from separate solubilities

$C_7H_6O_4$, Dihydroxybenzoic acid

$B = \text{Olive oil (11)}$; at $25^\circ C$, K' , calculated from separate solubilities = 1.0 ± 0.1 for 2, 4-A; = 0.3 ± 0.1 for 2, 5-A; = 0.05 ± 0.01 for 3, 4-A

$C_7H_6O_4$, Gentisic acid

$B = CHCl_3$, Chloroform (155)

$B = C_4H_{10}O$, Ethyl ether (156)

$B = C_8H_{10}$, Xylene (155)

$C_7H_6O_4$, Resorcylic acid

$B = C_4H_{10}O$, Ethyl ether (156)

$B = C_8H_{10}$, Xylene (155)

$C_7H_6O_5$, Gallic acid

$B = C_4H_{10}O$, Ethyl ether (156);

at $25 \pm 0.5^\circ C$, $K' = 0.45 \pm 0.01$ for $[A]_B = 0.00013\text{--}0.027$

C_7H_7NO , Benzamide

$B = \text{Codliver oil (9)}$

$B = \text{Olive oil (107)}$; cf. (108)

$^\circ C$	g A/l _B	K'
3	7.05	0.66 ± 0.03
36	5.33	0.43 ± 0.02

$C_7H_7NO_2$, *o*-Aminobenzoic acid

$B = CHCl_3$, Chloroform (155)

$t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 0.005$
0.0006	0.133
0.001	0.144
0.002	0.165
0.003	0.180

$B = C_4H_{10}O$, Ethyl ether (156);

at $25 \pm 0.5^\circ C$, $K' = 1.11 \pm 0.04$ for $[A]_B = 0.00056\text{--}$

0.0068

$B = C_6H_6$, Benzene (48)

$C_7H_7NO_2$, Salicylamide

$B = \text{Codliver oil (9)}$

$B = \text{Olive oil (107)}$

$^\circ C$	g A/l _B	$K' \pm 1$
3	1.27	22
36	1.07	14

$C_7H_8N_2O$, *p*-Nitrosomethylamine

$B = C_6H_6$, Benzene (48); at $6^\circ C$, $K' = 3.0 \pm 0.1$ for g A/l_B = 3.0–3.9; at $25^\circ C$, $K' = 3.3 \pm 0.1$ for g A/l_B = 0.54–0.92

$C_7H_8N_4O_2$, Theobromine

$B = \text{Olive oil (3)}$

$^\circ C$	$K' \pm 0.1$
16	1.4
17	1.7

$C_7H_8N_4O_2$, Theophylline

$B = \text{Olive oil (3)}$; at $18^\circ C$, $K' = 1.6 \pm 0.2$

C_7H_8O , *m*-Cresol

$B = C_4H_{10}O$, Ethyl ether (170)

C_7H_9N , Benzylamine

$B = CHCl_3$, Chloroform (155)

$t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 0.5$
0.004	12.9
0.007	14.0
0.01	14.8
0.015	15.7
0.02	16.3

$B = C_4H_{10}O$, Ethyl ether (156);

at $25 \pm 0.5^\circ C$, $K' = 2.05 \pm 0.1$ for $[A]_B = 0.0013\text{--}0.0096$

$B = C_8H_{10}$, Xylene (155)

$t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 0.08$
0.002	1.53
0.005	1.88
0.009	2.09
0.014	2.16

C_7H_9N , Methylaniline

$B = C_8H_{10}$, Xylene (155)

C_7H_9N , Toluidine

$B = C_6H_6$, Benzene (48); cf.

(50); at $25^\circ C$, $K' = 13.4 \pm 0.2$ for g A/l_B = 1.2–2.0

(ortho); $K' = 19.1 \pm 0.3$ for g A/l_B = 1.4–2.5 (meta);

$K' = 24.1 \pm 0.5$ for g A/l_B = 1.4–2.9 (para)

C_7H_9N , *o*-Toluidine

$B = C_2H_4O_2$, Acetic acid (3.5)

C_7H_9N , *p*-Toluidine

$B = CCl_4$ (170)

C_7H_9NO , *p*-Anisidine

$B = C_6H_6$, Benzene (48); at

$25^\circ C$, $K' = 6.0 \pm 0.1$ for g A/l_B = 4.35–9.01

$C_7H_{12}O_4$, Pimelic acid

$B = C_4H_{10}O$, Ethyl ether (21,

155); at $25 \pm 0.01^\circ C$, $K =$

0.72 ± 0.01 for $[A]_B = 0.0025\text{--}0.014$

$C_7H_{12}O_5$, Diacetin

$B = \text{Olive oil (6, 108)}$; at room temp., $K' = 0.23 \pm 0.02$

$C_7H_{14}O_2$, Isoamylacetic acid

$B = C_8H_{10}$, Xylene (155)

$C_7H_{15}NO$, Valerdimethylamide

$B = \text{Olive oil (64)}$; at $15^\circ R$,

$K' = 0.42 \pm 0.05$ for g A/l_B = 3.8

$C_7H_{15}NO$, Valerethylamide

$B = \text{Olive oil (64)}$; at $15^\circ R$,

$K' = 0.25 \pm 0.02$ for g A/l_B = 2.6

$C_7H_{15}NO_2$, Lactdiethylamide

$B = \text{Olive oil (64)}$; at $15^\circ R$,

$K' = 0.15 \pm 0.01$ for g A/l_B = 1.94

$C_7H_{16}O_4S_2$, Sulfonal

$B = \text{Olive oil (6, 108)}$; cf.

(121); at room temp., $K' =$

1.1 ± 0.1 for g A/l_B = 0.7–1.1

$C_7H_{15}NO_2$, Isobutylurethane

$B = \text{Codliver oil (9)}$

$C_7H_{17}N$, *n*-Heptylamine

$B = C_4H_{10}O$, Ethyl ether (156)

$t = 25 \pm 0.5^\circ C$

[A]_B

$K' \pm 0.5$

0.002

13.1

0.004

17.1

0.006

19.7

0.008

20.8

$B = C_8H_{10}$, Xylene (155)

$t = 25 \pm 0.5^\circ C$

[A]_B

$K' \pm 0.5$

0.001

11.1

0.004

14.4

0.007

18.2

0.01

22.3

$C_8H_6O_4$, Phthalic acid

$B = C_4H_{10}O$, Ethyl ether (21,

156)

$t = 25 \pm 0.5^\circ C$

[A]_B

K

0.001

1.36 ± 0.05

0.003

1.14 ± 0.05

0.005

1.05 ± 0.05

0.01

0.92 ± 0.03

0.02

0.84 ± 0.03

0.03

0.81 ± 0.03

$B = C_8H_{10}$, Xylene (155)

$B = \text{Olive oil (11)}$; at $25^\circ C$,

$K' = 0.01 \pm 0.001$, calculated from separate solubilities

$C_8H_6O_4$, Isophthalic acid

$B = C_4H_{10}O$, Ethyl ether (21);

at $25 \pm 0.01^\circ C$, $K = 0.0945$

± 0.001 for $[A]_B = 0.0028$

$C_8H_6O_4$, Piperonylic acid

$B = CHCl_3$, Chloroform (155)

$B = C_8H_{10}$, Xylene (155)

C₈H₆O₄, Terephthalic acid
B = Olive oil (11); at 25°C,
K' = 9 ± 1, calculated from
separate solubilities

C₈H₈O₂, Phenylacetic acid
B = CHCl₃, Chloroform (155)
t = 25 ± 0.5°C

[A] _B	K' ± 0.05
0.0005	1.71
0.0010	1.94
0.0015	2.14

B = C₄H₁₀O, Ethyl ether (156);
at 25 ± 0.5°C, K' = 15.2 ±
0.5 for [A]_B = 0.0012–0.016

B = C₈H₁₀, Xylene (155)
t = 25 ± 0.5°C

[A] _B	K' ± 0.02
0.001	0.52
0.003	0.77
0.005	1.00

C₈H₈O₂, Toluic acid
B = Olive oil (11); at 25°C,
K', calculated from separate
solubilities = 40 ± 4 for *o*-A;
21 ± 2 for *m*-A; and 29 ± 3
for *p*-A

C₈H₈O₃, *p*-Methoxybenzoic acid
B = CHCl₃, Chloroform (155)
t = 25 ± 0.5°C

[A] _B	K' ± 0.1
0.0007	5.15
0.001	5.6
0.0014	6.0
0.0018	6.4

B = C₈H₁₀, Xylene (155)

B = Olive oil (11); at 25°C, K'
= 12 ± 1, calculated from
separate solubilities

C₈H₈O₃, Mandelic acid
B = C₄H₁₀O, Ethyl ether (156)
B = C₆H₆, Benzene (149); at
19°C, K = 89.5 ± 1 for g
A/l_B = 0.16–0.75

B = C₇H₈O, Phenyl methyl
ether (149)

C₈H₈O₃, Vanillin
B = C₄H₁₀O, Ethyl ether (104);
at 25 ± 0.1°C, K = 0.107 ±
0.003 for g A/l_B = 1.3–3.3

**C₈H₈O₄, Guaiacyl acid carbon-
ate**

B = Olive oil (11); at 25°C,
K' = 3.7 ± 0.3

C₈H₉NO, Acetanilide
B = CHCl₃, Chloroform (104);
at 25 ± 0.1°C, K = 0.129 ±
0.003 for g A/l_B = 1.25–3.7
B = C₄H₁₀O, Ethyl ether (104);
at 25 ± 0.1°C, K = 0.335 ±
0.01 for g A/l_B = 0.9–3.4

B = C₆H₆, Benzene (48); at
25°C, K = 0.605 ± 0.005 for
g A/l_B = 5.8

**C₈H₁₀N₂O, *p*-Nitrosodimethyl-
aniline**

B = C₆H₆, Benzene (48); at
6°C, K' = 37.3 ± 0.5 for g
A/l_B = 3.7–5.5; at 25°C,
K' = 51 ± 1 for g A/l_B =
11.4–13.8

C₈H₁₀N₄O₂, Caffeine
B = CHCl₃, Chloroform (104);
at 25 ± 0.1°C, K = 0.047 ±
0.003 for g A/l_B = 1.88–
5.90

t = 19.5°C (45.5)	
g A/l _B	K
10	19.2 ± 0.4
20	15.4 ± 0.2
40	11.0 ± 0.2
80	7.0 ± 0.1
t = 25.0°C (45.5)	
10	17.9 ± 0.4
20	14.7 ± 0.2
40	11.2 ± 0.2
80	6.9 ± 0.1

B = CHCl₃, Chloroform (45.5)
D = Aqueous solutions of
H₂SO₄; C₂H₆O, Ethyl alco-
hol (1%); Na benzoate;
Na salicylate; KBr

D = H ₂ SO ₄ (1N)	
g A/l _B	K'
t = 19.5°C	
10	9.2 ± 0.3
20	8.2 ± 0.2
40	6.5 ± 0.1
80	4.5 ± 0.1
t = 25.0°C	
10	8.6 ± 0.3
20	7.7 ± 0.2
40	6.4 ± 0.2
80	4.5 ± 0.1

D = C ₂ H ₆ O (1%)	
t = 19.5°C	
10	23.4 ± 0.4
20	18.7 ± 0.4
40	12.8 ± 0.3
80	7.4 ± 0.2
D = NaC ₇ H ₅ O ₂ (0.1N)	
t = 19.5°C	
10	10.7 ± 0.3
20	9.4 ± 0.3
40	7.3 ± 0.2
80	4.9 ± 0.1
D = NaC ₇ H ₅ O ₃ (0.1N)	
10	5.1 ± 0.2
20	4.7 ± 0.2
40	4.1 ± 0.1
80	3.2 ± 0.1

D = KBr (1N)	
10	19.4 ± 0.4
20	15.6 ± 0.4
40	11.3 ± 0.3
80	7.0 ± 0.2

B = C₄H₁₀O, Ethyl ether (128,
129); at 25°C, K' = 7.2 ±
0.2

B = Olive oil (3)

°C	g A/l _B	K' ± 0.05
15	3.49	0.53
16	3.05	0.44
17	2.75	0.37

B = Sesame oil (174)

C₈H₁₁N, Benzylmethylamine,
B = C₄H₁₀O, Ethyl ether (156)
B = C₈H₁₀, Xylene (155)

**C₈H₁₁N, 2, 3, 4-Trimethylpyri-
dine**

B = C₇H₈, Toluene (63)

°C	[A] _B	K ± 0.002
0	0.0580	0.060
10	0.0587	0.044
20	0.0588	0.037*
30	0.0594	0.034*
50	0.0596	0.0285*
70	0.0597	0.025*
90	0.0598	0.022*

* ± 0.001.

C₈H₁₁N, 3, 4-Dimethylaniline
B = C₈H₁₀, Xylene (155)

C₈H₁₁N, Phenylethylamine
B = C₈H₁₀, Xylene (155)
C₈H₁₂N₂O₃, Veronal
B = Olive oil (118); at 17–
20°C, K' = 0.115 ± 0.01 for
g A/kg (A + B) = 0.26

C₈H₁₄O₄, Suberic acid
B = C₄H₁₀O, Ethyl ether (21,
155)

C₈H₁₄O₆, Diethyl tartrate
B = C₂H₄Br₂, Ethylene brom-
ide (178)

B = C₆H₆, Benzene (178)

t = 20°C	
g A/kg (A + B)	K'
10	5.4 ± 0.3
20	4.2 ± 0.1
30	3.6 ± 0.1

C₈H₁₇N, Coniine
B = C₄H₁₀O, Ethyl ether (156);
cf. (105); at 25 ± 0.5°C,
K' ± 0.3 = 5.6 for [A]_B =
0.0011–0.0019; = 7.0 for
[A]_B = 0.0037–0.0074

B = C ₈ H ₁₀ , Xylene (155)	
t = 25 ± 0.5°C	
[A] _B	K' ± 0.3
0.001	6.0
0.005	7.8
0.01	10.1

B = Sesame oil (174)

C₈H₁₈O₄S₂, Trional
B = Olive oil (6, 108, 118); *cf.*
(121); at 17–20°C, K' =
4.5 ± 0.4 for g A/l_B = 1.6–
3.4

C₉H₇N, Quinoline
B = C₈H₁₀, Xylene (155); at
25 ± 0.5°C, K' = 17 ± 2
for [A]_B = 0.0018–0.0094

C₉H₇NO, 8-Hydroxyquinoline
B = C₆H₆, Benzene (52)

C₉H₈O₂, Cinnamic acid
B = C₈H₁₀, Xylene (155)
t = 25 ± 0.5°C

[A] _B	K' ± 0.1
0.0005	3.0
0.001	4.5
0.0015	5.8
0.002	7.0

**C₉H₈O₄, *o*-Acetylsalicylic acid
(Aspirin)**

B = C₄H₁₀O, Ethyl ether (156)
t = 25 ± 0.5°C

[A] _B	K' ± 0.1
0.001	4.7
0.002	5.3
0.003	5.7
0.005	6.15
0.007	6.45
0.009	6.7

B = C₈H₁₀, Xylene (155)
t = 25 ± 0.5°C

[A] _B	K' ± 0.01
0.001	0.235*
0.002	0.280*
0.003	0.31
0.005	0.365
0.007	0.41

* ± 0.005.

C₉H₈O₄, Homophthalic acid
B = C₄H₁₀O, Ethyl ether (40)

C₉H₉NO₃, Hippuric acid
B = C₄H₁₀O, Ethyl ether (156)
t = 25 ± 0.5°C

[A] _B	K' ± 0.01
0.0005	0.40
0.001	0.38
0.002	0.36
0.003	0.35

C₉H₁₀O₂, Hydrocinnamic acid
B = CHCl₃, Chloroform (155)
t = 25 ± 0.5°C

[A] _B	K' ± 0.2
0.0007	7.5
0.0010	8.4
0.0013	9.1
0.0018	10.0

B = C₈H₁₀, Xylene (155)
t = 25 ± 0.5°C

[A] _B	K' ± 0.1
0.0015	3.0
0.003	3.9
0.005	4.3

C₉H₁₁NO, Aceto-*o*-toluidine
B = C₆H₆, Benzene (48)

C₉H₁₁NO₂, Phenylurethane
B = Olive oil (121); K' =
190 ± 20, calculated from
separate solubilities

C₉H₁₃N, Benzylethylamine
B = C₄H₁₀O, Ethyl ether (156)
B = C₈H₁₀, Xylene (155)

$C_9H_{14}O_6$, Triacetin
B = Olive oil (6, 108); at room temp., $K' = 0.3 \pm 0.05$

$C_9H_{16}O_4$, Azelaic acid
B = $C_4H_{10}O$, Ethyl ether (21, 155)

$C_9H_{17}NO_3$, Detonal
B = Olive oil (118); at 17–20°C, $K' = 1.75 \pm 0.1$ for g A/kg B = 2.13–5.48

$C_9H_{19}NO$, Valerdiethylamide
B = Olive oil (64); at 15°R, $K' = 5.8 \pm 0.6$ for g A/l_B = 13.4

$C_9H_{20}O_4S_2$, Tetronal
B = Olive oil (6, 108); at room temp., $K' = 4.0 \pm 0.4$

$C_9H_{21}N$, Tripropylamine
B = C_7H_8 , Toluene (109); at 18 ± 0.005°C, $K = 0.003 \pm 0.0005$ for [A]_B = 0.1

$C_{10}H_8O$, β-Naphthol
B = C_6H_6 , Benzene (92); at 29 ± 0.5°C, $K' = 67 \pm 5$ for g A/l_B = 9.2–30.3

$C_{10}H_9N$, Naphthylamine
B = C_6H_6 , Benzene (48); at 25°C, $K' = 252 \pm 10$ for g α-A/l_B = 15.6–31.7; = 279 ± 10 for g β-A/l_B = 15.9–25.4

$C_{10}H_{11}NO_3$, p-Acetoxyacetanilide
B = $CHCl_3$, Chloroform (45.5)
 $t = 25.0^\circ C$

g A/l _B	$K' \pm 0.3$
5	9.8
10	11.0
20	12.8
30	14.5

$C_{10}H_{14}N_2$, Nicotine
B = Sesame oil (174)

$C_{10}H_{14}N_4O_3$, Ethoxycaffeine
B = Olive oil (3); at room temp., $K' = 1.75 \pm 0.05$ for g A/l_B = 19.1

$C_{10}H_{14}O$, Thymol
B = Castor oil (146)
B = Codliver oil (146)
B = Cottonseed oil (146)
B = Linseed oil (146)
B = Olive oil (146); $K' \pm 20 = 450$ for g A/l_B = 45–450, at 25 ± 0.05°C; = 406 for g A/l_B = 46–460, at 37.2°C

B = Peanut oil (146)
B = Petrolatum (liquid) (146)

$C_{10}H_{16}O_4$, Camphoric acid
B = $CHCl_3$, Chloroform (155)

B = $C_4H_{10}O$, Ethyl ether (21, 166, 167); at 25 ± 0.01°C, $K = 0.0353 \pm 0.0005$ for [A]_B = 0.041–0.065
B = C_8H_{10} , Xylene (155)

$C_{10}H_{18}O_4$, Sebacic acid
B = $C_4H_{10}O$, Ethyl ether (21)

$C_{10}H_{19}N$, Bornylamine
B = C_8H_{10} , Xylene (155)

$C_{10}H_{19}N$, Camphylamine
B = C_8H_{10} , Xylene (155)

$C_{10}H_{19}NO_3$, Epronol
B = Olive oil (118); at 17–20°C, $K' = 3.3 \pm 0.1$ for g A/kg (A + B) = 2.57

$C_{11}H_{12}N_2O$, Antipyrine
B = $CHCl_3$, Chloroform (45.5)
 $t = 25.0^\circ C$

g A/l _B	K'
10	17.6 ± 0.3
20	15.6 ± 0.3
40	12.4 ± 0.2
80	8.2 ± 0.2

B = $CHCl_3$, Chloroform (45.5)
D = Aqueous solutions of H_2SO_4 ; Na salicylate
 $t = 25.5^\circ C$

g A/l _B	K'
10	1.14 ± 0.02
25	1.16 ± 0.02
50	1.19 ± 0.02
D = H_2SO_4 (1N)	
10	16.0 ± 0.3
20	14.0 ± 0.3
40	11.5 ± 0.3
80	7.6 ± 0.2

$C_{11}H_{16}N_2O_2$, Pilocarpine
B = Sesame oil (174)

$C_{12}H_{11}N_3$, p-Aminoazobenzene
B = C_6H_6 , Benzene (48); at 25°C, $K' = 3170 \pm 100$ for g A/l_B = 28.4–36.6

$C_{12}H_{12}O_5$, α-Keto-γ-phenyladipic acid

B = $C_4H_{10}O$, Ethyl ether (40)

$C_{13}H_{20}N_2O_2$, Novocaine
B = Sesame oil (174)

$C_{14}H_{12}O_3$, Benzilic acid
B = $CHCl_3$, Chloroform (155)
 $t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 0.06$
0.0003	1.27
0.0006	1.70
0.001	2.11
0.0015	2.54
0.0018	2.77

B = $C_4H_{10}O$, Ethyl ether (156)
 $t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 1$
0.001	17.5
0.003	24.3
0.005	27.5

B = $C_4H_{10}O$: 25 ± 0.5°C.—
(Continued)

[A] _B	$K' \pm 1$
0.007	29.5
0.009	30.5

B = C_8H_{10} , Xylene (155)
 $t = 25 \pm 0.5^\circ C$

[A] _B	$K' \pm 0.02$
0.0001	0.27
0.0004	0.49
0.0007	0.65
0.001	0.80

$C_{15}H_{22}ClNO_2$, β-Eucaine hydrochloride
B = Sesame oil (174)

$C_{17}H_{19}NO_3$, Morphine
B = $CHCl_3$, Chloroform (116)
D = Aqueous C_2H_6O , Ethyl alcohol; mixture of 0.08 g morphine hydrochloride, C cm³ of H_2O , D cm³ of alcohol and 10 cm³ of $CHCl_3$ were shaken together, after which the layers were nearly equal in volume

C	D	K
20	0	75
17.5	2.5	4
15	5	1
12.5	7.5	0.5
10	10	0.2

B = $CHCl_3 + CH_4O$, Methyl alcohol (mixtures) (105)
D = Aqueous solution of K_2CO_3 ; equal parts $CHCl_3$ and CH_4O ; 40g K_2CO_3 /50 cm³ H_2O ; at 25 ± 0.1°C, $K = 0.15 \pm 0.02$ for g A/l_B = 1.2–3.6

B = $CHCl_3 + C_2H_6O$, Ethyl alcohol (mixtures) (105)
D = Aqueous NaCl; $CHCl_3$, 2 parts; C_2H_5OH , 1 part; NaCl, 35 g/100 cm³ H_2O ; at 25 ± 0.1°C, $K = 0.53 \pm 0.05$ for g A/l_B = 0.40–0.97

B = Sesame oil (174)

$C_{17}H_{19}NO_3.HCl$, Morphine hydrochloride

B = $CHCl_3 + C_5H_{12}O$ (mixture: chloroform, 3 vols. + amyl alcohol, 1 vol.) (105)

D = Aqueous solution of NH_4OH ; at 25 ± 0.1°C, $K' = 0.345 \pm 0.03$ for g A/l_B = 0.70–1.42

$C_{17}H_{21}NO_4$, Cocaine
B = Sesame oil (174)

$C_{17}H_{22}BrN$, Methylpropyl-phenylbenzylammonium bromide

B = $CHCl_3$, Chloroform (176)

$C_{17}H_{23}NO_3$, Atropine
B = $CHCl_3$, Chloroform (144); cf. (105)

$t = 25^\circ C$

g A*	$K' \pm 1$
0.01	8.0†
0.05	17
0.10	23
0.20	30
0.40	37
0.60	39

* Per 15 cm³ soln. (A + B).
† ± 0.5

B = Sesame oil (174)

$C_{18}H_{21}N_3O$, Codeine
B = $CHCl_3$ (105)

D = Aqueous solution of NH_4OH ; at 25 ± 0.1°C, $K = 0.0067 \pm 0.0003$ for g A/l_B = 2.40–5.63

B = $C_4H_{10}O$, Ethyl ether (105)
D = Aqueous solution of NH_4OH ; at 25 ± 0.1°C, $K = 0.94 \pm 0.04$ for g A/l_B = 0.47–1.45

B = Sesame oil (174)

$C_{18}H_{34}O_2$, Oleic acid
B = Benzine (79)

D = Aqueous solution of C_2H_6O , Ethyl alcohol

$C_{19}H_{24}ClNO_3(2H_2O)$, Dionine
B = Sesame oil (174)

$C_{20}H_{14}O_4$, Phenolphthalein
B = C_6H_6 , Benzene (137); $K' = 13.1 \pm 0.2$

$C_{20}H_{20}ClN_3$, Fuchsin (131, 132)
B = $C_4H_{10}O$, Isobutyl alcohol
 $t = 25^\circ C$

g A/l _B	$K' \pm ?$
0.018	24.0
0.103	4.3
0.620	1.94

B = $C_4H_{10}O$, Isobutyl alcohol (131, 132)

D = HCl, 7 M per l
 $t = 25^\circ C$

g A/l _B	$K' \pm ?$
0.042	8.0
0.232	9.3
1.108	7.9

$C_{22}H_{24}ClN_3$, Fuchsin new (Höchst)

B = $C_4H_{10}O$, Isobutyl alcohol (131, 132)
 $t = 25^\circ C$

g A/l _B	$K' \pm ?$
0.0125	6.5
0.600	2.1
5.700	1.8

$C_{20}H_{24}N_2O_2$, Quinine

B = $CHCl_3$, Chloroform (105)

D = Aqueous solution of NH_4OH ; at 25°C, K is "very small"

B = C₄H₁₀O, Ethyl ether (168)
t = 0°C

g A/l _B	K ± 0.05
5	0.66
10	0.53
15	0.40

B = Sesame oil (174)

C₂₁H₂₂N₂O₂, Strychnine
B = CHCl₃, Chloroform (144)
t = 25°C

g A/l _B	K' ± 1
1.7	25
8.7	61
41.5	64

B = Sesame oil (174)

C₂₁H₂₃N₃O₆, Strychnine
nitrate
B = CHCl₃, Chloroform (144)
t = 25°C

g A/l _B	K ± 0.1
0.28	5.3
1.62	4.2
11.3	2.0

C₂₁H₂₄N₂O₆S, Strychnine
sulfate
B = CHCl₃, Chloroform (105)
D = Aqueous solution of
NH₄OH; at 25 ± 0.1°C,
K = 0.003 ± 0.001 for g
A/l_B = 1.65-4.7

B = CHCl₃ + C₄H₁₀O (Ethyl
ether) (mixtures) (105)

D = Aqueous solution of
NH₄OH; at 25 ± 0.1°C,
K = 0.087 ± 0.002 for g
A/l_B = 1.4-3.3

C₂₂H₂₃NO₇, Narcotine

B = Sesame oil (174)

C₂₂H₂₄BrN, Tribenzylmethyl-
ammonium bromide

B = CHBr₃, Bromoform (44)

B = CHCl₃, Chloroform (44)

C₂₂H₂₄ClN, Tribenzylmethyl-
ammonium chloride

B = CHBr₃, Bromoform (44)

C₂₂H₂₅NO₆, Colchicine

B = Sesame oil (174)

C₂₃H₂₆N₂O₄, Brucine

B = Sesame oil (174)

C₃₂H₄₉NO₉, Veratrine
B = Sesame oil (174); at 20°C,
K' = 12 ± 1 for g A/l_B =
13.9, calculated from separate
solubilities

C₃₄H₄₇NO₁₁, Aconitine
B = CHCl₃, Chloroform (105)
D = Aqueous solution of
NH₄OH; at 25 ± 0.1°C,
K = 0.017 ± 0.002 for g
A/l_B = 3.2-5.6

B = C₄H₁₀O, Ethyl ether (105)

D = Aqueous solution of
NH₄OH; at 25 ± 0.1°C,
K = 0.140 ± 0.005 for g
A/l_B = 1.2-3.1

MISCELLANEOUS TABLE

The A-component (the dis-
tributed component) is a dye-
stuff or a material of unknown
or indefinite composition.

Alphabetical arrangement

Le constituant A (le consti-
tuant distribué) est une teinture
ou une matière de composition
inconnue ou non définie.

Arrangement alphabétique.

Die A-Komponente (der ver-
teilte Stoff) ist ein Farbstoff
oder ein Stoff unbekannter oder
unbestimmter Zusammenset-
zung.

Alphabetische Anordnung.

Il componente A (ripartito
tra i due liquidi) è una sostanza
colorante o un prodotto di com-
posizione sconosciuta o non
definita.

Ordine alfabetico.

Alcohols

B = Fats (141)

Aliphatic acids, mixtures of

B = C₄H₁₀O, Ethyl ether (103)

B = Wines (103)

Alkali Blue 6 B (Bayer)

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

g A/l _B	K' ± ?
0.105	13.3
0.212	14.0
0.425	14.1

Congo Red (Bayer)

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

g A/l _B	K' ± ?
0.0022	0.24
0.012	0.13
0.042	0.09

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

D = 4M KOH/l

t = 25°C

g A/l _B	K' ± ?
0.0024	0.36
0.010	0.23
0.060	0.13

Erythrosine A (Höchst)

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

B = C₄H₁₀O.—(Continued)
t = 25°C

g A/l _B	K' ± ?
0.011	7.9
0.0234	2.2
0.063	0.14

Fuchsin, v. p. 432

Methylene Blue

B = C₆H₇N, Aniline (123)

Methylene Blue, D

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

g A/l _B	K' ± ?
0.0052	0.76
0.054	0.30
0.108	0.24

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

D = HCl (2N)

t = 25°C

g A/l _B	K' ± ?
0.0075	1.07
0.0224	0.60
0.192	0.44

Methylene Blue, G (Conc.)
(Basel)

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

g A/l _B	K' ± ?
0.0043	2.7
0.050	0.64
0.156	0.34

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

D = HCl (0.33N)

g A/l _B	K' ± ?
0.00227	7.1
0.043	1.45
0.268	0.88

D = KOH (0.003N)

g A/l _B	K' ± ?
0.018	4.5
0.070	2.8
0.500	1.67

Patent Blue (Höchst)

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

g A/l _B	K' ± ?
0.0010	0.24
0.375	0.17

Phenolphthalein, v. p. 432

Ponceau Crystal

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

g A/l _B	K' ± ?
0.001	0.05
0.006	0.03
0.015	0.03

B = C₆H₁₂O, Amyl alcohol
(151)

Quinoline Yellow (Bayer)

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

B = C₄H₁₀O.—(Continued)
t = 25°C

g A/l _B	K' ± ?
0.018	1.6
0.200	1.7
0.964	1.5

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

D = HCl (10N)

g A/l _B	K' ± ?
0.036	5.5
0.390	6.4
2.030	6.4

D = KOH (10N)

g A/l _B	K' ± ?
0.017	1.4
0.160	1.14
0.800	1.11

Rocelline (Basel)

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

g A/l _B	K' ± ?
0.0118	7.3
0.0736	2.4
0.300	1.7

Violet Crystal (Basel)

B = C₄H₁₀O, Isobutyl alcohol
(131, 132)

t = 25°C

g A/l _B	K' ± ?
0.017	19
0.104	5.3
0.820	3.35

NON-AQUEOUS SYSTEMS

A = I ₂	
B = CCl ₄ , Carbon tetrachloride	C = CHCl ₃ , Chloroform (93)
B = CCl ₄ , Carbon tetrachloride	C = C ₃ H ₈ O ₃ , Glycerol (93)
B = CHCl ₃ , Chloroform	C = C ₃ H ₈ O ₃ , Glycerol (63, 72)
B = C ₄ H ₁₀ O, Ethyl ether	C = C ₂ H ₆ O ₂ , Glycol (93)
B = C ₄ H ₁₀ O, Ethyl ether	C = C ₃ H ₈ O ₃ , Glycerol (63)
B = C ₆ H ₆ , Benzene	C = CCl ₄ , Carbon tetrachloride (93)
B = C ₆ H ₆ , Benzene	C = C ₃ H ₈ O ₃ , Glycerol (93)
A = CH ₂ O ₂ , Formic acid	
B = C ₄ H ₁₀ O, Ethyl ether	C = H ₂ SO ₄ (5); also H ₂ SO ₄ + NaCl
A = C ₂ H ₄ O ₂ , Acetic acid	
B = CHCl ₃ , Chloroform	C = C ₃ H ₈ O ₃ , Glycerol (74)

B = C ₄ H ₁₀ O, Ethyl ether (110)	
C = Fused salts; CaCl ₂ ·6H ₂ O; LiNO ₃ ·3H ₂ O	
A = C ₂ H ₆ O, Ethyl alcohol	
B = C ₄ H ₁₀ O, Ethyl ether (110)	C = CaCl ₂ ·6H ₂ O (fused)
B = C ₆ H ₆ , Benzene (110)	C = CaCl ₂ ·6H ₂ O (fused)
A = C ₅ H ₁₀ O ₂ , Valeric acid	
B = Benzene	C = H ₂ SO ₄ (60)
A = C ₈ H ₁₄ O ₆ , Diethyl tartrate (178)	
B = C ₂ H ₄ Br ₂ , Ethylene bromide	C = CH ₃ NO, Formamide
A = C ₁₀ H ₁₆ O, Citral	
B = C ₂ H ₆ O, Ethyl alcohol	C = Lemon oil (105); at 25 ± 0.1°C, K _B = 0.07 ± 0.01 for g A/l _B = 27.5–33.4

A = H ₃ BO ₃	
B = C ₅ H ₁₂ O, Amyl alcohol	C = C ₃ H ₈ O ₃ , Glycerol (74)
The B-component is Acetone.	
The C-component is Glycerol (157).	
CH ₂ O ₂ , Formic acid	
C ₂ HCl ₃ O ₂ , Trichloroacetic acid	
C ₂ H ₃ BrO ₂ , Bromoacetic acid	
C ₂ H ₂ Cl ₂ O ₂ , Dichloroacetic acid	
C ₂ H ₃ ClO ₂ , Chloroacetic acid	
C ₂ H ₄ O ₂ , Acetic acid	
C ₂ H ₄ OS, Thioacetic acid	
C ₂ H ₇ N, Ethylamine	
C ₂ H ₇ N, Dimethylamine	
C ₃ H ₄ O ₄ , Malonic acid	
C ₃ H ₅ BrO ₂ , 1-Bromopropionic acid	
C ₃ H ₆ O ₂ , Propionic acid	
C ₄ H ₄ O ₄ , Fumaric acid	
C ₄ H ₄ O ₄ , Maleic acid	
C ₄ H ₅ BrO ₄ , Bromosuccinic acid	
C ₄ H ₆ O ₄ , Succinic acid	
C ₄ H ₆ O ₅ , Malic acid	
C ₄ H ₆ O ₆ , Tartaric acid	

C ₄ H ₈ O ₂ , <i>n</i> -Butyric acid
C ₄ H ₈ O ₂ , Isobutyric acid
C ₄ H ₁₁ N, Diethylamine
C ₅ H ₈ O ₄ , Glutaric acid
C ₅ H ₁₀ O ₂ , Isovaleric acid
C ₅ H ₁₁ N, Piperidine
C ₆ H ₁₃ N, <i>n</i> -Methylpiperidine
C ₆ H ₁₅ N, Dipropylamine
C ₆ H ₁₅ N, Triethylamine
C ₇ H ₆ O ₅ , Gallic acid
C ₇ H ₇ NO ₂ , Anthranilic acid
C ₈ H ₆ O ₄ , Phthalic acid
C ₈ H ₈ O ₃ , Mandelic acid
C ₉ H ₉ NO ₃ , Hippuric acid
Acid phthalates of C ₂ H ₇ N, Dimethylamine; C ₃ H ₉ N, Trimethylamine; C ₄ H ₁₁ N, Diethylamine; C ₅ H ₁₁ N, Piperidine; C ₆ H ₁₃ N, <i>n</i> -Methylpiperidine; C ₆ H ₁₅ N, Dipropylamine and Triethylamine; C ₉ H ₁₃ N, Benzylethylamine; C ₉ H ₂₁ N, Tripropylamine; C ₁₀ H ₂₃ N, Diisoamylamine

LITERATURE

(For a key to the periodicals see end of volume)

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P-V-T RELATIONS IN THE GASEOUS STATE FOR SUBSTANCES WHICH ARE LIQUID OR SOLID AT 0° AND 1 ATMOSPHERE

F. G. KEYES

VALUES OF pv

Pressure in atmospheres, volume in liters per gram, unless otherwise indicated

A-Tables.—Elementary Substances

As, Arsenic (5, 7, 22, 28)

$p_{\text{atm.}}$	600°C	700°C	800°C	900°C	1000°C	1100°C	1200°C
0.020	0.275	0.363	0.420	0.492			
0.035	0.272	0.340	0.394	0.458	0.593		
0.050	0.269	0.325	0.376	0.437	0.549	0.712	0.900
0.100	0.259	0.298	0.342	0.393	0.496	0.613	0.777
0.200	0.242	0.284	0.324	0.357	0.434	0.534	0.674
0.300	0.231	0.278	0.316	0.347	0.411	0.498	0.626
0.400	0.223	0.273	0.310	0.340	0.399	0.474	0.596
0.500		0.268	0.304	0.335	0.389	0.457	0.576
0.600		0.263	0.300	0.332	0.382	0.444	0.558
0.700		0.258	0.296	0.330	0.376	0.434	0.539
0.800		0.256	0.294	0.328	0.373	0.426	0.522
0.900			0.292	0.327	0.371	0.421	0.507
1.000				0.326	0.370	0.418	0.494
1.100					0.369	0.414	0.484

Br, Bromine (11, 15, 18, 19, 20, 21)

$p_{\text{atm.}}$	700°C	800°C	900°C	1000°C	1100°C	1200°C	1300°C
0.500	0.4987						
0.600	0.4987	0.5532	0.6119				
0.700	0.4987	0.5530	0.6115	0.6795			
0.800	0.4987	0.5528	0.6112	0.6779	0.7560		
0.900		0.5524	0.6108	0.6763	0.7530	0.8487	
1.000		0.5520	0.6105	0.6747	0.7509	0.8423	0.9639
1.1000			0.6101	0.6731	0.7492	0.8382	0.9574
1.2000				0.6715	0.7476	0.8360	0.9533
1.3000					0.7461	0.8343	
1.4000						0.8329	

I, Iodine (4, 12, 13, 17, 29, 31, 33, 34)

$p_{\text{atm.}}$	500°C	800°C	900°C	1000°C	1100°C	1200°C
0.400	0.2495	0.3725				
0.500	0.2495	0.3718	0.4339			
0.600	0.2495	0.3709	0.4313	0.5135		
0.700		0.3698	0.4288	0.5083	0.6119	
0.800		0.3684	0.4263	0.5034	0.6046	0.7240
0.900		0.3665	0.4237	0.4987	0.5979	0.7151
1.000			0.4212	0.4942	0.5918	0.7065
1.100				0.4899	0.5862	0.6983

$p_{\text{atm.}}$	500°C	800°C	900°C	1000°C	1100°C	1200°C
1.200				0.4857	0.5806	0.6906
1.300					0.5752	0.6835
1.400						0.6770
1.500						0.6735
1.600						0.6700

P, Phosphorus (7, 14, 22, 28, 30)

$p_{\text{atm.}}$	500°C	600°C	700°C	800°C	900°C	1000°C	1100°C	1200°C
0.050	0.586	0.638	0.787	0.860				
0.100	0.562	0.612	0.701	0.818	1.012	1.340	1.754	2.210
0.200	0.536	0.597	0.674	0.774	0.914	1.156	1.486	1.946
0.300	0.524	0.590	0.664	0.760	0.881	1.084	1.354	1.799
0.400	0.516	0.585	0.658	0.749	0.866	1.044	1.288	1.704
0.500		0.582	0.653	0.740	0.856	1.020	1.248	1.632
0.600			0.649	0.732	0.847	1.004	1.212	1.572
0.700					0.838	0.988	1.194	1.520
0.800							1.160	1.478
0.900							1.140	1.440
1.000							1.122	1.407
1.100								1.378

S, Sulfur (6, 7, 8, 9, 10, 17, 23, 28, 32, 34, 35)

$p_{\text{atm.}}$	250°C	300°C	350°C	400°C	450°C	500°C
0.01	0.1835	0.2095	0.2560			0.735
0.015	0.1798	0.2071	0.2419	0.3220	0.475	0.731
0.020		0.2056	0.2355	0.3080	0.474	0.716
0.050			0.2304	0.2748	0.376	0.587
0.100			0.2283	0.2639	0.328	0.473
0.150			0.2276	0.2609	0.314	0.422
0.200				0.2590	0.306	0.393
0.300				0.2561	0.299	0.370
0.400				0.2532	0.295	0.360
0.500				0.2507	0.291	0.352
0.600					0.286	0.344
0.700					0.284	0.336
0.800						0.329
0.900						0.322
1.000						0.316
1.100						0.311

$p_{\text{atm.}}$	550°C	600°C	650°C	850°C	950°C	1020°C
0.050	0.954	1.127	1.216	1.519		
0.100	0.781	1.042	1.169	1.498	1.623	1.701
0.150	0.674	0.964	1.128	1.481	1.612	1.694
0.200	0.604	0.893	1.092	1.467	1.604	1.688

S.—(Continued)

$p_{\text{atm.}}$	550°C	600°C	650°C	850°C	950°C	1020°C
0.300	0.528	0.787	1.037	1.447	1.584	1.675
0.400	0.489	0.719	0.996	1.434	1.574	1.664
0.500	0.464	0.674	0.960	1.426	1.566	1.657
0.600	0.448	0.639	0.925	1.420		
0.700	0.433	0.610	0.892	1.416		
0.800	0.421	0.587	0.858			
0.900	0.409	0.566	0.826			
1.000	0.400	0.549	0.798			
1.100	0.389	0.532	0.771			
1.200	0.380	0.516	0.750			
1.300			0.734			

Se, Selenium (5, 22, 28, 35)

$p_{\text{atm.}}$	500°C	550°C	600°C	650°C	700°C	750°C	800°C	850°C	900°C
0.010	0.206	0.251							
0.015	0.197	0.248	0.327	0.404	0.455				
0.020	0.190	0.245	0.328	0.406	0.459	0.504			
0.035	0.179	0.234	0.326	0.408	0.466	0.510	0.538	0.576	0.598
0.050	0.172	0.223	0.314	0.407	0.471	0.516	0.542	0.578	0.601
0.100		0.188	0.254	0.366	0.464	0.520	0.552	0.582	0.608
0.200			0.216	0.288	0.386	0.481	0.538	0.572	0.604
0.300				0.258	0.331	0.442	0.514	0.556	0.592
0.400				0.246	0.300	0.410	0.498	0.548	0.584
0.500					0.284	0.385	0.483	0.539	0.580
0.600					0.278	0.373	0.472	0.532	0.578
0.700					0.272	0.364	0.460	0.523	0.575
0.800						0.355	0.450	0.515	0.572
0.900						0.347	0.440	0.507	0.567
1.000							0.418	0.496	0.562
1.100								0.490	0.557

B-Tables.—Chemical Compounds

H₂O, Superheated steam (1, 2, 16, 16.5)

$p_{\text{atm.}}$	110°C	120°C	130°C	140°C	150°C
1.00	1.723	1.772	1.819	1.866	1.912
1.1	1.720	1.769	1.817	1.864	1.910
1.2	1.717	1.767	1.815	1.863	1.909
1.3	1.713	1.764	1.813	1.861	1.907
1.4	1.710	1.761	1.811	1.859	1.906
1.5		1.759	1.809	1.857	1.904
1.6		1.756	1.807	1.855	1.902
1.7		1.754	1.805	1.854	1.901
1.8		1.751	1.803	1.852	1.899
1.9		1.748	1.800	1.850	1.898
2.0	160°C	170°C	1.798	1.848	1.896
2.5	1.936	1.987	1.786	1.838	1.887
3.0	1.929	1.979		1.828	1.878
3.5	1.922	1.972		1.816	1.869
4.0	1.914	1.965			1.859
4.5	1.906	1.957			1.849
5.0	1.897	1.949			
5.5	1.887	1.941			
6.0	1.878	1.933			
6.5		1.924	180°C		
7.0		1.916	1.970		
7.5		1.906	1.962	185°C	
8.0			1.954	1.981	
8.5			1.946	1.973	
9.0			1.937	1.966	
9.5			1.927	1.957	
10.0				1.947	
10.5				1.937	
11.0				1.925	

CH₄O, Methyl alcohol (26)

Volume in decaliters (10 l) per gram

$p_{\text{atm.}}$	120°C	160°C	180°C	200°C	230°C	240°C
2	0.0991	0.1107	0.0933*	0.1204	0.1291	0.1313
4	0.0944	0.1082		0.1192	0.1286	0.1309
6	0.0883	0.1057		0.1179	0.1279	0.1305
8		0.1031		0.1164	0.1272	0.1299
10	0.0900†	0.1003	0.1089	0.1149	0.1263	0.1292
12		0.0969	0.1064	0.1134	0.1253	0.1283
14		0.0931	0.1037	0.1118	0.1242	0.1273
16		0.0883	0.1010	0.1101	0.1229	0.1262
18		0.08213	0.0986	0.1082	0.1216	0.1249
20			0.0947	0.1062	0.1201	0.1236
22			0.0911	0.1041	0.1185	0.1221
24	220°C		0.0872	0.1018	0.1169	0.1206
26	0.1098	225°C	0.0831	0.0994	0.1151	0.1189
28	0.1078	0.1101		0.0968	0.1132	0.1173
30	0.1057	0.1082		0.0939	0.1113	0.1157
32	0.1037	0.1062		0.0908	0.1092	0.1140
34	0.1016	0.1042		0.0874	0.1072	0.1123
36	0.0993	0.1022		0.0834	0.1051	0.1105
38	0.0969	0.1001		0.0794	0.1029	0.1087
40	0.0944	0.0978			0.1007	0.1069
42	0.0918	0.0954			0.0983	0.1051
44	0.0891	0.0929			0.0959	0.1032
46	0.0859	0.0903				0.1014
48	0.0827	0.0876				0.0998
50	0.0789	0.0847				0.0974
52	0.0747	0.0816				0.0953
54	0.0697	0.0781				0.0931
56	0.0639	0.0746				0.0908
58		0.0695				0.0883
60		0.0635				0.0858
62						0.0830
64						0.0801
66						0.0770
68						0.0736
70						0.0699
72						0.0656
74						0.0605
76						0.0540
78						0.0443

$p_{\text{atm.}}$	232°C	234°C	236°C	238°C	239°C	239.5°C
28	0.1136	0.1146	0.1154	0.1162	0.1166	
30	0.1119	0.1128	0.1137	0.1146	0.1149	
32	0.1101	0.1111	0.1121	0.1129	0.1133	
34	0.1082	0.1093	0.1104	0.1112	0.1116	
36	0.1064	0.1074	0.1086	0.1094	0.1099	
38	0.1044	0.1054	0.1068	0.1076	0.1081	
40	0.1023	0.1035	0.1049	0.1057	0.1062	
42	0.1002	0.1014	0.1029	0.1038	0.1044	
44	0.0980	0.0993	0.1009	0.1018	0.1024	
46	0.0957	0.0971	0.0987	0.0998	0.1003	
48	0.0933	0.0947	0.0966	0.0977	0.0982	
50	0.0908	0.0923	0.0942	0.0954	0.0960	
52	0.0882	0.0898	0.0918	0.0932	0.0938	
54	0.0854	0.0872	0.0893	0.0907	0.0914	
56	0.0825	0.0844	0.0867	0.0882	0.0890	
58	0.0794	0.0816	0.0839	0.0856	0.0865	
60	0.0760	0.0785	0.0808	0.0828	0.0838	
62	0.0723	0.0752	0.0778	0.0799	0.0812	
64	0.0680	0.0716	0.0742	0.0767	0.0783	0.0793
66	0.0628	0.0675	0.0704	0.0734	0.0752	0.0762
68	0.0562	0.0626	0.0662	0.0698	0.0717	0.0728

* At 100°C. † At 140°C.

$p_{\text{atm.}}$	232°C	234°C	236°C	238°C	239°C	239.5°C
70		0.0552	0.0611	0.0657	0.0679	0.0690
72			0.0543	0.0609	0.0634	0.0647
74				0.0543	0.0579	0.0593
76					0.0500	0.0523
78						0.0407

 $\text{C}_2\text{H}_4\text{O}_2$, Acetic acid (24)

$p_{\text{atm.}}$	92°C	105.1°C	118°C	132.9°C	147.6°C	162.5°C	184.1°C
0.04	0.377	0.426	0.474				
0.06	0.363	0.414	0.463				
0.08	0.354	0.404	0.453				
0.10	0.346	0.395	0.444				
0.12	0.340	0.387	0.436		0.525	0.565	0.605
0.14	0.335	0.380	0.429	0.478	0.517	0.561	0.602
0.16	0.330	0.373	0.422	0.471	0.510	0.557	0.599
0.18	0.326	0.368	0.416	0.465	0.504	0.553	0.596
0.20	0.322	0.362	0.410	0.459	0.498	0.550	0.594
0.22	0.318	0.357	0.405	0.453	0.493	0.546	0.592
0.24	0.315	0.353	0.400	0.448	0.488	0.543	0.590
0.26	0.312	0.350	0.395	0.444	0.484	0.540	0.588
0.28	0.308	0.346	0.391	0.439	0.480	0.537	0.586
0.30	0.305	0.343	0.386	0.435	0.477	0.534	0.584
0.32	0.302	0.340	0.382	0.431	0.474	0.531	0.582
0.34	0.300	0.338	0.379	0.428	0.470	0.529	0.581
0.36	0.297	0.335	0.375	0.424	0.467	0.526	0.579
0.38	0.294	0.332	0.372	0.420	0.464	0.523	0.578
0.40		0.330	0.369	0.417	0.461	0.520	0.576
0.42		0.327	0.366	0.414	0.459	0.518	0.575
0.44		0.325	0.364	0.411	0.456	0.516	0.574
0.46		0.323	0.361	0.408	0.454	0.513	0.572
0.48		0.320	0.359	0.405	0.451	0.511	0.571
0.50		0.318	0.356	0.402	0.449	0.508	0.569
0.52		0.316	0.354	0.400	0.447	0.506	0.568
0.54		0.313	0.352	0.397	0.445	0.504	0.566
0.56		0.311	0.350	0.395	0.442	0.501	0.565
0.58		0.308	0.348	0.392	0.440	0.499	0.564
0.60		0.306	0.346	0.390	0.438	0.497	0.562
0.62		0.304	0.345	0.388	0.436	0.495	0.561
0.64		0.302	0.343	0.386	0.434	0.492	0.559
0.66			0.341	0.384	0.432	0.490	0.558
0.68			0.339	0.382	0.431	0.488	0.556
0.70			0.338	0.380	0.429	0.486	0.555
0.72			0.336	0.379	0.427	0.484	0.554
0.74			0.335	0.377	0.425	0.482	0.552
0.76			0.333	0.376	0.423	0.480	0.551
0.78			0.332	0.374	0.421	0.478	0.549
0.80			0.330	0.373	0.420	0.476	0.548
0.82			0.329	0.371	0.418	0.474	0.546
0.84			0.328	0.370	0.416	0.472	0.545
0.86			0.327	0.369	0.415	0.470	0.543
0.88			0.325	0.367	0.413	0.468	0.542
0.90			0.324	0.366	0.411	0.466	0.540
0.92			0.323	0.365	0.409	0.464	0.539
0.94			0.322	0.363	0.408	0.462	
0.96				0.362	0.406	0.460	
0.98				0.361	0.404		
1.00				0.360	0.402		

$p_{\text{atm.}}$	50°C	78.4°C	$p_{\text{atm.}}$	78.4°C	$p_{\text{atm.}}$	78.4°C
0.02	0.268		0.10	0.307	0.18	0.289
0.04	0.246	0.341	0.12	0.302	0.20	0.286
0.06	0.235	0.325	0.14	0.296	0.22	0.283
0.08		0.315	0.16	0.293	0.24	0.281

$p_{\text{atm.}}$	162.5°C	183.75°C	200°C	240°C	280°C	$p_{\text{atm.}}$	280°C
2	0.397					18	0.527
3	0.357	0.437	0.487	0.607		19	0.517
4		0.407	0.459	0.587	0.683	20	0.506
5		0.379	0.435	0.568	0.671	21	0.496
6			0.413	0.550	0.659	22	0.485
7			0.393	0.533	0.648	23	0.474
8				0.518	0.636	24	0.464
9				0.503	0.624	25	0.453

$p_{\text{atm.}}$	162.5°C	183.75°C	200°C	240°C	280°C	$p_{\text{atm.}}$	280°C
10				0.486	0.613	26	0.443
11				0.471	0.602	27	0.432
12				0.456	0.591	28	0.421
13				0.442	0.580	29	0.409
14				0.428	0.569	30	0.396
15				0.413	0.558	31	0.381
16					0.548	32	0.364
17					0.538		

 $\text{C}_2\text{H}_6\text{O}$, Ethyl alcohol (25)

$p_{\text{atm.}}$	130°C	140°C	150°C	160°C	170°C	180°C	190°C
4	0.6843	0.708	0.7343	0.7567	0.7783	0.7973	
5	0.666	0.695	0.722	0.746	0.768	0.7887	0.8157
6	0.633	0.6797	0.7097	0.735	0.758	0.7803	0.808
7		0.661	0.6963	0.7233	0.7473	0.7717	0.800
8			0.681	0.7117	0.737	0.7627	0.7917
9			0.6617	0.699	0.726	0.7537	0.7833
10			0.633	0.6857	0.715	0.7443	0.7747
11				0.671	0.7033	0.7347	0.766
12				0.6523	0.6917	0.7243	0.7567
13					0.679	0.7137	0.747
14					0.6645	0.7025	0.7373
15					0.6463	0.6907	0.727

$t, ^\circ\text{C}$	$p_{\text{atm.}}$		$p_{\text{atm.}}$	180°C	190°C	$p_{\text{atm.}}$	190°C
	2	3					
100	0.646		16	0.6777	0.7167	21	0.654
110	0.6707	0.648	17	0.663	0.705	22	0.6387
	4		18	0.646	0.6935	23	0.6217
120	0.655		19	0.625	0.681	24	0.602
			20		0.668		

$p_{\text{atm.}}$	200°C	210°C	220°C	225°C	230°C	232°C	234°C
5	0.834	0.851	0.8583	0.8653	0.875	0.8833	0.8997
6	0.827	0.845	0.853	0.8607	0.8707	0.879	0.8955
7	0.8197	0.839	0.8473	0.8557	0.866	0.874	0.891
8	0.8123	0.833	0.8415	0.8503	0.861	0.869	0.8867
9	0.8047	0.826	0.8357	0.845	0.856	0.864	0.882
10	0.797	0.8195	0.8293	0.839	0.8507	0.859	0.8767
11	0.789	0.8127	0.823	0.833	0.845	0.8533	0.871
12	0.7813	0.8057	0.8163	0.827	0.8393	0.8473	0.8653
13	0.773	0.7983	0.8093	0.8203	0.8333	0.8413	0.8595
14	0.765	0.7907	0.8027	0.8137	0.827	0.8353	0.8533
15	0.756	0.783	0.7953	0.807	0.8207	0.829	0.847
16	0.747	0.775	0.788	0.800	0.8143	0.8225	0.840
17	0.7377	0.7667	0.7807	0.793	0.8077	0.8157	0.8337
18	0.728	0.758	0.773	0.786	0.8007	0.809	0.8267
19	0.718	0.7495	0.7653	0.7783	0.7947	0.802	0.820
20	0.7077	0.7407	0.7573	0.771	0.7863	0.795	0.8127
21	0.6967	0.7317	0.7493	0.763	0.779	0.7875	0.8057
22	0.6853	0.7223	0.741	0.7553	0.7713	0.780	0.798
23	0.6735	0.713	0.7327	0.7473	0.764	0.7723	0.7907
24	0.6607	0.703	0.7243	0.7393	0.756	0.7647	0.783
25	0.647	0.693	0.7157	0.731	0.748	0.757	0.7753
26	0.632	0.683	0.707	0.7227	0.740	0.749	0.767
27	0.616	0.6723	0.698	0.7143	0.7317	0.741	0.759
28	0.5977	0.661	0.689	0.7055	0.7233	0.7327	0.751
29	0.577	0.649	0.6797	0.6967	0.715	0.7243	0.743
30		0.6365	0.670	0.6877	0.7063	0.716	0.735
31		0.6227	0.660	0.6787	0.6973	0.7073	0.7265
32		0.6077	0.6495	0.6693	0.6885	0.6985	0.718
33		0.5915	0.6387	0.660	0.6797	0.6897	0.7097
34		0.573	0.6275	0.650	0.6703	0.681	0.701

C_2H_6O .—(Continued)

$p_{atm.}$	200°C	210°C	220°C	225°C	230°C	232°C	234°C
35		0.551	0.615	0.640	0.661	0.672	0.692 ₇
36			0.602 ₃	0.630	0.651 ₇	0.662 ₇	0.684
37			0.588 ₇	0.619 ₃	0.642	0.653	0.675
38			0.573 ₇	0.608 ₃	0.632	0.643 ₅	0.666
39			0.557	0.597	0.622	0.633 ₇	0.657
40				0.585	0.612	0.623 ₇	0.647 ₃
41				0.572	0.601 ₇	0.613 ₇	0.637 ₅
42				0.557 ₇	0.590 ₇	0.603	0.627 ₃
43				0.542	0.579 ₃	0.592 ₅	0.617
44				0.523 ₃	0.567 ₃	0.581 ₃	0.606
45				0.500	0.554 ₇	0.569 ₅	0.594 ₃
46				0.469 ₅	0.541	0.556 ₇	0.582 ₃
47					0.525 ₃	0.543	0.569 ₇
48					0.506	0.527 ₇	0.556
49					0.482	0.510	0.541 ₅
50					0.445	0.488	0.525 ₃
51						0.456	0.506 ₇
52							0.483 ₅
53							0.452

$p_{atm.}$	236°C	237°C	238°C	239°C	240°C	241°C	242°C
5	0.903	0.904 ₇	0.906 ₃	0.908 ₃	0.910	0.911	0.912
6	0.899	0.901	0.903	0.905	0.907	0.908	0.909 ₃
7	0.895	0.897 ₃	0.899 ₃	0.901 ₃	0.903 ₃	0.904 ₇	0.906 ₃
8	0.890 ₇	0.893	0.895 ₃	0.897 ₅	0.899 ₇	0.901	0.902 ₇
9	0.886	0.888 ₅	0.891	0.893	0.895	0.897	0.898 ₇
10	0.881 ₃	0.883 ₇	0.886	0.888 ₃	0.890 ₇	0.892 ₃	0.894
11	0.876	0.878 ₇	0.881	0.883 ₃	0.885 ₇	0.887 ₃	0.889
12	0.870 ₇	0.873	0.875 ₇	0.878	0.880 ₃	0.882	0.884
13	0.865	0.867 ₃	0.870	0.872 ₃	0.875	0.876 ₃	0.878 ₃
14	0.859	0.861 ₃	0.864	0.866 ₇	0.869	0.870 ₇	0.872 ₇
15	0.852 ₇	0.855 ₃	0.858	0.860 ₇	0.863	0.865	0.866 ₇
16	0.846 ₃	0.849	0.852	0.854 ₇	0.857	0.859	0.860 ₇
17	0.840	0.842 ₇	0.845 ₃	0.848 ₃	0.850 ₇	0.852 ₇	0.854 ₇
18	0.833 ₃	0.836	0.839	0.842	0.844 ₇	0.846 ₅	0.848 ₃
19	0.826 ₇	0.829 ₅	0.832 ₇	0.835 ₇	0.838	0.840 ₃	0.842
20	0.820	0.823	0.826	0.829	0.831 ₇	0.834	0.836
21	0.813	0.816	0.819	0.822	0.825	0.827 ₃	0.829 ₃
22	0.806	0.809	0.812 ₃	0.815 ₃	0.818 ₇	0.820 ₇	0.823 ₀
23	0.799	0.802	0.805 ₇	0.808 ₅	0.812	0.814	0.816 ₃
24	0.791 ₇	0.795	0.792 ₅	0.801 ₇	0.805	0.807 ₃	0.809 ₇
25	0.784	0.787 ₇	0.791 ₅	0.794 ₅	0.798 ₃	0.800 ₃	0.803
26	0.776 ₇	0.780 ₃	0.784	0.787 ₃	0.791 ₃	0.793 ₅	0.796
27	0.769	0.773	0.777	0.780 ₃	0.784	0.786 ₅	0.789
28	0.761 ₇	0.765 ₃	0.769 ₅	0.773	0.777	0.779 ₃	0.782
29	0.754	0.758	0.762	0.765 ₇	0.769 ₇	0.772	0.774 ₇
30	0.746	0.750	0.754 ₃	0.758	0.762 ₃	0.765	0.767 ₃
31	0.738	0.742	0.746 ₃	0.750 ₃	0.755	0.757 ₇	0.760
32	0.730	0.734	0.738 ₇	0.743	0.747 ₇	0.750	0.753
33	0.721 ₇	0.726	0.730 ₇	0.735	0.739 ₇	0.742 ₅	0.745 ₃
34	0.713 ₃	0.719	0.722 ₃	0.727	0.732	0.735	0.737 ₇
35	0.705	0.709 ₃	0.714	0.718 ₇	0.724	0.727	0.730
36	0.696	0.700 ₇	0.705 ₇	0.710 ₃	0.716	0.719	0.722
37	0.687 ₇	0.692	0.697	0.702	0.707 ₇	0.711	0.714
38	0.678 ₇	0.683 ₃	0.688 ₅	0.693 ₅	0.699	0.702 ₇	0.706
39	0.669 ₇	0.674 ₃	0.679 ₇	0.684 ₈	0.690	0.694	0.698
40	0.660	0.665	0.670 ₃	0.676	0.681 ₃	0.685 ₇	0.689
41	0.650 ₇	0.656	0.661	0.666 ₇	0.672 ₃	0.676 ₇	0.681
42	0.640 ₇	0.646	0.651 ₃	0.657 ₃	0.663	0.667 ₇	0.672
43	0.630 ₃	0.636	0.641 ₇	0.647 ₇	0.653 ₇	0.658 ₅	0.663
44	0.619 ₇	0.625 ₃	0.631 ₃	0.637 ₉	0.643 ₇	0.649	0.654
45	0.608 ₅	0.614 ₇	0.620 ₇	0.627 ₃	0.633 ₇	0.639 ₅	0.644 ₇
46	0.597	0.603	0.609 ₇	0.616 ₅	0.623 ₂	0.629 ₃	0.635
47	0.584 ₅	0.591	0.598	0.605 ₅	0.612 ₇	0.619	0.625

$p_{atm.}$	236°C	237°C	238°C	239°C	240°C	241°C	242°C
48	0.571 ₅	0.578 ₅	0.585 ₇	0.593 ₇	0.602	0.608 ₃	0.614 ₃
49	0.557 ₇	0.564 ₇	0.573	0.581 ₇	0.590 ₅	0.597 ₃	0.603 ₃
50	0.543	0.550 ₃	0.559	0.568 ₇	0.578 ₇	0.585 ₃	0.592
51	0.526 ₇	0.534	0.545	0.555 ₃	0.566	0.573	0.580
52	0.508 ₃	0.516 ₅	0.529	0.541	0.552 ₇	0.560	0.567
53	0.487	0.497	0.512	0.525 ₇	0.538	0.545 ₅	0.553 ₃
54	0.460	0.475	0.492 ₃	0.508 ₃	0.522	0.530	0.538
55	0.425	0.449	0.470	0.489	0.504 ₃	0.513 ₃	0.521 ₇
56			0.443 ₅	0.467	0.485 ₃	0.495	0.504
57			0.412 ₅	0.443	0.465	0.475 ₅	0.485 ₃
58				0.418 ₅	0.444 ₅	0.454 ₃	0.465 ₃

$p_{atm.}$	243.1°C	244.35°C	246°C	$p_{atm.}$	243.1°C	244.35°C	246°C
5	0.914	0.916 ₇	0.920	32	0.757	0.761 ₃	0.769 ₇
6	0.911 ₅	0.914	0.918	33	0.749 ₇	0.754	0.762 ₃
7	0.908 ₇	0.911	0.915	34	0.742	0.746 ₇	0.755
8	0.905	0.907	0.912	35	0.734 ₇	0.739	0.747 ₇
9	0.901	0.904	0.908 ₇	36	0.727	0.731 ₃	0.740
10	0.897	0.900	0.904 ₇	37	0.719 ₃	0.724	0.732
11	0.892	0.895 ₇	0.900 ₅	38	0.711 ₇	0.716	0.724 ₃
12	0.887	0.891	0.896	39	0.703 ₇	0.708	0.716 ₇
13	0.881 ₇	0.885 ₇	0.891	40	0.695 ₇	0.700	0.708 ₇
14	0.876	0.880	0.886	41	0.687 ₇	0.692 ₃	0.700 ₃
15	0.870	0.874 ₃	0.880 ₃	42	0.679 ₃	0.684	0.692 ₃
16	0.864 ₃	0.868 ₇	0.875	43	0.670 ₇	0.675 ₇	0.684
17	0.858	0.862 ₇	0.869	44	0.662	0.667	0.675 ₃
18	0.852	0.856 ₇	0.863	45	0.653	0.658 ₇	0.666 ₇
19	0.846	0.850 ₃	0.857	46	0.644	0.649 ₇	0.658
20	0.839 ₅	0.844	0.851	47	0.634 ₃	0.640 ₃	0.648 ₇
21	0.833	0.838	0.844 ₇	48	0.624 ₃	0.631	0.639
22	0.826 ₇	0.831 ₅	0.838 ₃	49	0.614	0.621	0.629 ₃
23	0.820	0.825	0.832	50	0.603 ₃	0.611	0.619
24	0.813 ₃	0.818	0.825 ₃	51	0.592	0.600 ₃	0.608 ₇
25	0.806 ₇	0.811 ₃	0.818 ₇	52	0.579 ₇	0.589	0.597
26	0.800	0.804 ₇	0.812	53	0.566 ₇	0.577	0.585 ₇
27	0.793	0.797 ₇	0.805	54	0.552 ₃	0.564	0.573
28	0.786	0.790 ₃	0.798	55	0.536 ₇	0.550	0.560
29	0.779	0.783 ₃	0.791 ₃	56	0.520	0.535 ₃	0.546
30	0.771 ₇	0.776	0.784	57	0.501 ₃	0.519 ₇	0.531 ₃
31	0.764 ₃	0.768 ₇	0.777	58	0.481	0.502 ₃	0.515 ₅

 C_3H_8O , Propyl alcohol (27)

$p_{atm.}$	180°C	200°C	220°C	230°C	240°C	260°C	280°C
3	0.585						
4	0.576	0.607	0.639	0.655	0.670	0.699	0.726
5	0.566	0.599	0.632	0.649	0.663	0.693	0.722
6	0.555	0.590	0.624	0.642	0.657	0.688	0.718
7	0.545	0.582	0.617	0.635	0.651	0.682	0.713
8	0.533	0.573	0.610	0.628	0.645	0.677	0.708
9	0.521	0.564	0.602	0.621	0.638	0.671	0.704
10	0.509	0.555	0.594	0.614	0.632	0.666	0.699
11		0.545	0.586	0.606	0.625	0.660	0.694
12		0.535	0.578	0.599	0.618	0.654	0.689
13		0.524	0.570	0.591	0.611	0.649	0.684
14		0.512	0.562	0.583	0.604	0.643	0.679
15		0.500	0.553	0.575	0.597	0.637	0.674
16			0.544	0.566	0.589	0.631	0.669
17			0.535	0.558	0.582	0.625	0.663
18			0.526	0.549	0.574	0.619	0.650
19			0.516	0.540	0.566	0.612	0.653

$p_{atm.}$	220°C	230°C	240°C	250°C	260°C	270°C	280°C
20	0.505	0.531	0.558	0.582	0.606		0.647
21	0.493	0.522	0.549	0.575	0.599	0.623	0.642
22	0.481	0.512	0.541	0.567	0.593	0.617	0.636

$p_{\text{atm.}}$	220°C	230°C	240°C	250°C	260°C	270°C	280°C
23	0.468	0.501	0.532	0.559	0.586	0.611	0.630
24	0.453	0.490	0.523	0.551	0.579	0.604	0.625
25		0.479	0.514	0.543	0.572	0.598	0.619
26		0.466	0.504	0.534	0.565	0.591	0.613
27		0.452	0.494	0.525	0.557	0.585	0.607
28		0.437	0.483	0.517	0.550	0.578	0.601
29		0.419	0.472	0.507	0.542	0.571	0.595
30			0.460	0.498	0.534	0.564	0.589
31			0.447	0.488	0.525	0.556	0.583
32			0.432	0.477	0.516	0.549	0.576
33			0.416	0.466	0.507	0.541	0.570
34			0.396	0.455	0.498	0.534	0.563
35				0.443	0.488	0.525	0.556
36				0.429	0.478	0.517	0.549
37				0.415	0.468	0.509	0.542
38				0.399	0.457	0.500	0.535
39				0.380	0.446	0.490	0.527
40					0.434	0.481	0.520
41					0.420	0.471	0.512
42			263.64°C		0.406	0.461	0.504
43			0.412		0.390	0.450	0.496
44			0.399		0.372	0.439	0.487
45			0.385		0.352	0.427	0.478
46			0.369		0.328	0.415	0.469
47			0.351		0.298	0.401	0.459
48			0.328			0.388	0.449
49			0.298			0.373	0.439
50			0.260			0.357	0.428
51						0.338	0.418
52						0.318	0.406
53						0.293	0.395
54						0.264	0.383
55							0.370
56							0.356
57							0.341
58							0.325
59							0.309
60							0.291
61							0.273
62							0.254
63							0.235

 $\text{C}_4\text{H}_{10}\text{O}$, Ethyl ether (3)Volume in cm^3 per gram; the last figure given has relative significance only

$p_{\text{atm.}}$	200°C	225°C	250°C	275°C	300°C	375°C
15	444.45	483.32	521.19	556.27	591.71	625.09
20	412.56	457.37	499.39	537.59	576.22	612.29
25	375.89	429.21	476.38	519.35	560.50	599.31
30	268.54	398.24	452.19	500.04	544.48	586.17
35	273.62	364.00	426.91	480.15	528.25	572.95
40		325.61	400.43	459.80	511.82	559.63
45		283.25	373.05	439.12	495.44	546.31
50		236.96	345.66	418.65	479.40	533.14
55			319.08	398.80	463.85	520.19
60			293.91	380.10	449.08	508.39
65				362.86	435.09	497.03
70				352.92	420.07	486.33
75				335.62	410.35	476.29
80					399.46	467.31
85					389.59	458.84
90						451.18

LITERATURE

(For a key to the periodicals see end of volume)

- (1) Battelli, 6, 26: 394; 92. (2) Battelli, 6, 3: 408; 94. (3) Beattie, 1, 46: 342; 24. (4) Biltz, 7, 2: 920; 88. (5) Biltz, 7, 19: 385; 96. (6) Biltz, 25, 34: 2490; 01. (7) Biltz and Meyer, 7, 4: 249; 89. (8) Biltz and Preuner, 57, 22: 627; 01. (9) Bleier and Kohn, 25, 33: 50; 00. (10) Bleier and Kohn, 57, 21: 575; 00. (11) Bodenstein and Cramer, 9, 22: 327; 16. (12) Crafts and Meier, 25, 13: 851; 80. (13) Crafts and Meier, 34, 90: 690; 80. (14) Hittorf, 8, 126: 193; 65. (15) Jahn, 25, 15: 1238; 82. (16) Jakob, 98, 56: 1980; 12. (16.5) Knoblauch, Linde and Klebe, 414, No. 21: 33; 05. (17) Krause and Meyer, 7, 6: 5; 90. (18) Meyer, 25, 13: 394; 80. (19) Meyer and Pzüblin, 25, 13: 405; 80. (20) Perman, 5, 48: 45; 90. (21) Perman and Atkinson, 5, 66: 10; 00. 7, 33: 215, 577; 00. (22) Preuner and Brockmöller, 7, 81: 129; 12. (23) Preuner and Schupp, 7, 68: 129; 09. (24) Ramsay and Young, 4, 49: 790; 86. (25) Ramsay and Young, 62, 177: 123; 86. (26) Ramsay and Young, 62, 178: 314; 87. (27) Ramsay and Young, 62, 180: 137; 89. (28) Sainte-Claire Deville and Troost, 34, 56: 891; 63. (29) Starck and Bodenstein, 9, 16: 961; 10. (30) Stock, Gibson and Stamm, 25, 45: 3527; 12. (31) Thiele, 93, 1: 277; 92. (32) Troost, 34, 86: 1394; 78. (33) Troost, 34, 91: 54; 80. (34) Troost, 34, 95: 30; 82. (35) Wartenberg, 93, 56: 320; 07.

COMPRESSIBILITY OF SOLUTIONS

L. H. ADAMS

The fragmentary nature of the recorded data makes it impossible to reconcile conflicting values, or to calculate true compressibility coefficients. The information is therefore given merely in the form of literature references.

AQUEOUS SOLUTIONS

Solute	P , range megabaryes	t , range °C	Lit.
B-Table			
HBr.....	1- 8	18	(21)
HCl.....	1- 8	15-20	(21, 22)
H ₂ SO ₄	1- 8	17-22	(21, 22)
NH ₄ OH.....	1	18	(23)
HNO ₃	1- 8	15-18	(21, 22)
NH ₄ NO ₃	1	18	(23)
NH ₄ Cl.....	1- 8	0-22	(2, 21, 22, 23)
NH ₄ Br.....	1- 8	18	(21)

Solute	P , range megabaryes	t , range °C	Lit.
NH ₄ I.....	1- 8	18	(21)
(NH ₄) ₂ SO ₄	1- 300	18-20	(10, 16, 21, 24)
ZnSO ₄	1- 750	15	(22, 26)
Fe ₂ (SO ₄) ₃	1- 8	15-18	(21, 22)
MgSO ₄	1- 850	15	(24, 26)
CaCl ₂	1- 10	0-20	(7, 23)
SrCl ₂	1	0-20	(23)
BaCl ₂	1- 300	0-20	(22, 23, 24)
LiOH.....	1- 8	18	(21)
LiCl.....	1- 9	14-18	(16, 21)
LiBr.....	1- 9	14-18	(16, 21)
LiI.....	1- 8	18	(21)
Li ₂ SO ₄	1	18	(23)

Solute	<i>P</i> , range megabaryes	<i>t</i> , range °C	Lit.
LiNO ₃	1- 9	14-18	(16, 21)
NaOH.....	1- 950	15-18	(23, 26)
NaCl.....	1- 300	0-20	(10, 16, 21, 23, 24)
NaBr.....	1- 9	14-18	(16, 20)
NaI.....	1	18	(23)
Na ₂ SO ₄	1- 8	19	(21, 22)
NaNO ₃	1- 300	14-20	(10, 16)
Na ₂ CO ₃	1- 900	15-20	(10, 21, 26)
KOH.....	1- 900	15-20	(21, 22, 26)
KCl.....	1- 300	0-20	(7, 10, 16, 21, 23)
KClO ₃	1	17	(22)
KBr.....	1- 9	14-18	(16, 21)
KI.....	1- 300	18-20	(10, 21)
K ₂ SO ₃	1	18	(23)
K ₂ SO ₄	1	18	(23)
KNO ₃	1- 9	14-18	(16, 21)
K ₄ Fe(CN) ₆	1- 300		(24)
K ₂ Cr ₂ O ₇	1	17	(22)
RbCl.....	1- 9	14	(16)
CsCl.....	1- 9	14	(16)
Sea water.....	<i>v. infra</i>		(9, 24)

C-Table			
C ₂ H ₅ OH.....	1-1500	0-70	(11, 13, 14)
(C ₂ H ₅) ₂ O.....	100- 300	20	(18)
CH ₃ COOCH ₃	100- 300	20	(18)
CH ₃ COOH.....	1- 275	25-35	(8)
CH ₂ ClCOOH.....	1- 300	25	(8)
CHCl ₂ COOH.....	1- 290	25	(8)
CCl ₃ COOH.....	1- 270	25	(8)
Sucrose.....	1-1500	0-30	(1, 4, 5, 11, 17, 24, 25)
Urethane.....	100- 300	20	(19)
α-Methyl glucoside	1- 70	0-30	(1)
Casein.....	100- 300	20	(15)
Peptone.....	100- 300	20	(15)

NON-AQUEOUS SOLUTIONS

C-Table				
A	B	<i>P</i> , range mega- baryes	<i>t</i> , range °C	Lit.
CCl ₄	C ₆ H ₆	1- 600	25	(6)
CS ₂	CHCl ₃	1- 10	25	(7)
CS ₂	C ₂ H ₅ OH	1- 10	25	(7)
CS ₂	CH ₃ COCH ₃	1- 430	25	(20)
CHCl ₃	CH ₃ COOH	1- 500	25	(20)
CHCl ₃	C ₂ H ₅ OH	1- 10	25	(7)
CHCl ₃	CH ₃ COCH ₃	1- 480	25	(20)
CHCl ₃	(C ₂ H ₅) ₂ O	1- 600	25	(6)
C ₂ H ₄ Cl ₂	C ₆ H ₆	1- 600	25	(6)
CH ₃ COOH.....	C ₆ H ₆	1- 450	25	(20)
CH ₃ COOH.....	C ₆ H ₅ CH ₃	1- 450	25	(20)
C ₂ H ₅ OH.....	C ₆ H ₆	1- 480	25	(20)
C ₂ H ₅ OH.....	Resorcinol	1- 250	188-242	(10)
CH ₃ COCH ₃	C ₅ H ₁₁ OH	1-1000	16- 26	(3)
(C ₂ H ₅) ₂ O.....	C ₆ H ₅ COOH	1- 250	150-212	(10)
C ₆ H ₁₁ OH.....	C ₆ H ₆	1-1000	16- 26	(3)
C ₆ H ₅ NO ₂	C ₆ H ₆	1- 360	25	(20)
C ₆ H ₅ NO ₂	C ₆ H ₅ CH ₃	1- 430	25	(20)
C ₆ H ₅ NH ₂	C ₆ H ₆	1- 520	25	(20)
C ₆ H ₅ NH ₂	C ₆ H ₁₄		40	(12)
C ₆ H ₅ NH ₂	C ₆ H ₅ CH ₃	1- 550	25	(20)

RELATIVE VOLUMES OF SEA WATER FOR DIFFERENT TEMPERATURES AND PRESSURES (13, 19)

See also Heck and Service, U. S. Coast and Geodetic Survey, Spec. Publ. No. 108

Salinity: 31.130 parts per mille by weight					
<i>P</i>	0°C	4.97°C	9.97°C	14.96°C	19.96°C
0	0.97560	0.97595	0.97660	0.97749	0.97862
200	.96672	.96731	.96815	.96919	.97042
400	.95840	.95919	.96019	.96136	.96270
600	.95056	.95153	.95268	.95397	.95539
Salinity: 38.525 parts per mille					
0	0.96996	0.97041	0.97113	0.97209	0.97326
200	.96130	.96196	.96286	.96396	.96523
400	.95317	.95403	.95508	.95629	.95766
600	.94551	.94654	.94772	.94904	.95049

VOLUME AND COMPRESSIBILITY, $\beta = \left(\frac{1}{v_0} \frac{dv}{dP}\right)$ OF SEA WATER AT 0°C AND 35. $\frac{0}{00}$ SALINITY

<i>P</i> , megabarye	<i>v</i> , cm ³ /g (?)	10 ⁶ β
0	0.97264	46.4
100	.96819	45.0
200	.96388	43.6
300	.95970	42.3
400	.95566	41.0
500	.95173	39.8
600	.94791	38.7
700	.94421	37.6
800	.94060	36.6
900	.93709	35.6
1000	.93367	34.7

LITERATURE

(For a key to the periodicals see end of volume)

(¹) Berkeley, Hartley and Burton, 62, 218: 295; 19. (²) Braun, 8, 31: 331; 87. (³) Carnazzi, 59, 9: 161; 05. (⁴) Cohen and de Boer, 7, 84: 41; 13. (⁵) Cohen and Valetton, 7, 92: 433; 17. (⁶) Dolezalek and Speidel, 7, 94: 72; 20. (⁷) Drecker, 8, 20: 870; 83. (⁸) Drucker, 7, 52: 641; 05. (⁹) Ekman, *Die Zusammendruckbarkeit des Meerwassers, etc.* Conseil permanent international pour l'exploration de la mer. Publications de circonstance No. 43. Copenhagen, 1908. (¹⁰) Gilbaut, 7, 24: 385; 97. (¹¹) Guinchant, 34, 132: 469; 01. (¹²) Keyes and Hildebrand, 1, 39: 2126; 17. (¹³) Moesveld, 7, 105: 450; 23. (¹⁴) Pagliani, 22, 5 I: 777, 885, 937; 89. (¹⁵) Palitzsch, 1, 41: 346; 19. (¹⁶) Pohl, *Diss.*, Bonn, 1906. (¹⁷) Quincke, 8, 41: 669; 90. (¹⁸) Richards and Chadwell, 1, 47: 2283; 25. (¹⁹) Richards and Palitzsch, 1, 41: 59; 19. (²⁰) Ritzel, 7, 60: 319; 07. (²¹) Roentgen and Schneider, 8, 29: 165; 86. 34: 531; 88. (²²) Schmidt, 75, 114 IIa: 945; 05. (²³) Schumann, 8, 31: 14; 87. (²⁴) Tait, 68, 20: 141; 95. (²⁵) Valetton, *Diss.*, Utrecht, 1914. (²⁶) Watson, 68, 33: 282; 13.

LITERATURE REFERENCES

LITERATURE REFERENCES

In all literature references cited in International Critical Tables the name of the journal or publication is indicated by means of a *Key Number* corresponding to the list given below. The numbers which follow this key number in a literature citation are, in the order named: (1) the volume, (2) the page, and (3) the last two figures of the year. Thus *64V*, **31**: 253; 22, indicates *Verslag Koninklijke Akademie van Wetenschappen te Amsterdam*, Vol. 31, page 253, 1922. Series numbers are not given. Key Numbers referring to books and other non-serial publications are preceded by the letter *B*, and the volume number is given in Roman numerals. Thus *B10*, **IV**: 191; 18, indicates Doelter, *Handbuch der Mineralchemie*, page 191 of Vol. 4 of the 1918 edition. The Key Number *O* is used to indicate "private communication from."

DAS LITERATURVERZEICHNIS

In allen Literaturstellen, die in I. C. T. verzeichnet sind, ist der Name der Zeitschrift oder der Publikation mit Hilfe einer *Schlüsselnummer*, entsprechend der unten folgenden Liste, angegeben. Die Zahlen, welche diesen Schlüsselnummern bei einem Literaturzitat folgen, bedeuten der Reihe nach: (1) der Band, (2) die Seite und (3), die letzten zwei Zahlen des Jahrganges. So bedeutet z. B. *64V*, **31**: 253; 22, *Verslag Koninklijke Akademie van Wetenschappen te Amsterdam*, Band 31, Seite 253, 1922. Seriennummern werden nicht angegeben. Der Schlüsselzahl wird ein *B* vorausgesetzt, wenn sie Bücher, oder eine andere nicht periodische Veröffentlichung bezeichnet. Die Bandnummer wird durch römische Ziffern angegeben. Es bedeutet z. B. also *B10*, **IV**: 191; 18, Doelter, *Handbuch der Mineralchemie*, Seite 191, des 4 Bandes, der Auflage des Jahres 1918. Die Schlüsselzahl *O* wird gebraucht, um anzuzeigen, dass es eine "private Mitteilung" ist.

KEY TO THE PERIODICALS

Data regarding the libraries which receive many of these periodicals may be found through the following sources:

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1. Journal of the American Chemical Society.
2. Physical Review.
3. London, Edinburgh and Dublin Philosophical Magazine and Journal of Science.
4. Journal of the Chemical Society, London. (Memoirs of the Chemical Society; continued as Quarterly Journal; later Journal.)

RÉFÉRENCES BIBLIOGRAPHIQUES

Le nom du journal ou de la publication de toutes les références bibliographiques citées dans les Tables Critiques Internationales est indiqué au moyen d'un *nombre-clé* correspondant à la liste donnée ci-dessous. Les nombres qui suivent ce nombre-clé dans un renvoi bibliographique indiquent dans l'ordre suivant: (1) le volume, (2) la page, et (3) les deux derniers chiffres de l'année. Ainsi *64V*, **31**: 253; 22, indique *Verslag Koninklijke Akademie van Wetenschappen te Amsterdam*, Vol. 31, page 253, 1922. Les numéros des séries ne sont pas donnés. Les nombres-clés se rapportant à des livres ou à des publications non périodiques sont précédés de la lettre *B* et le numéro du volume est donné en chiffres romains. Ainsi *B10*, **IV**: 191; 18, indique Doelter, *Handbuch der Mineralchemie*, page 191 du volume 4 de l'édition de 1918. Le nombre-clé *O* est employé pour indiquer "communication privée de."

INDICAZIONI BIBLIOGRAFICHE

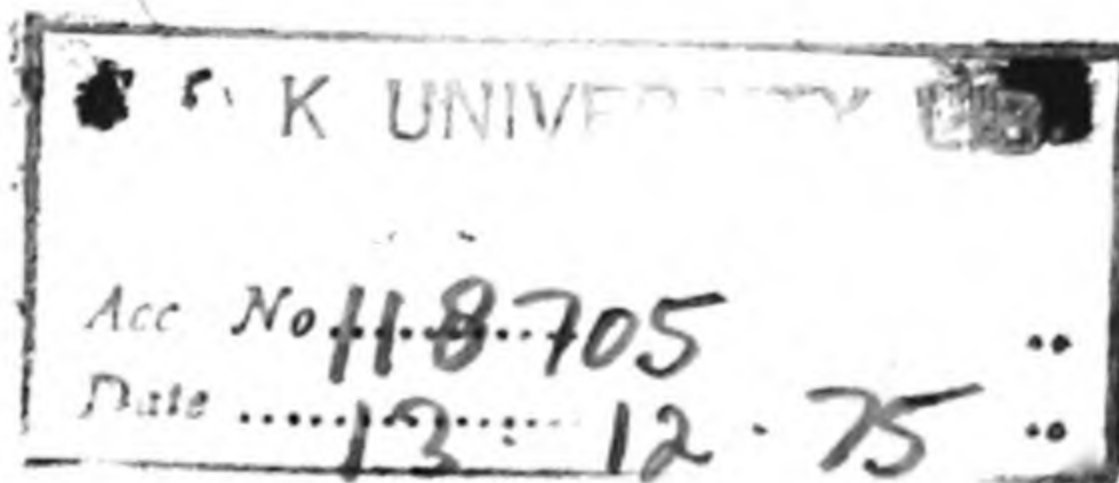
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6. Annales de chimie et de physique. (Divided into Nos. 14 and 16 in 1914.)
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13. Annalen der Chemie, Justus Liebig's.
14. Annales de chimie.
16. Annales de physique.
18. Archives néerlandaises des sciences exactes et naturelles. Series IIIA (Sciences exactes).
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22. Atti della reale accademia nazionale dei Lincei. (Rendiconti classe di scienze fisiche, matematiche e naturali.)
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24. Atti del reale istituto Veneto di scienze, lettere ed arti.
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27. Bulletin de la société chimique de France. (Before 1908 was Bulletin de la société chimique de Paris.)
28. Bulletin de la société chimique de Belgique. (Before 1904 was Bulletin de l'association belge des chimistes.)
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34. Comptes rendus hebdomadaires des séances de l'académie des sciences, de l'institut de France.
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37. Helvetica Chimica Acta.
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52. Journal für praktische Chemie.
53. Journal of the Russian Physico-Chemical Society. (Chemical part.)
54. Journal of the Society of Chemical Industry.
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97. Zeitschrift für technische Physik.
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238. Travaux et mémoires du bureau international des poids et mesures.
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278. Archiv für die gesamte Physiologie des Menschen und der Tiere. (Pflüger.)
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